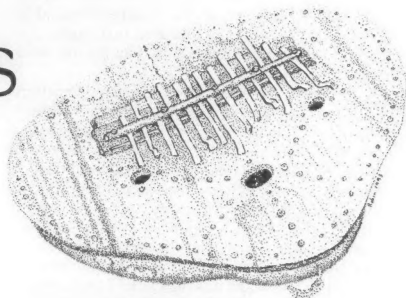


FOR THE DESIGN, CONSTRUCTION AND ENJOYMENT OF UNUSUAL SOUND SOURCES

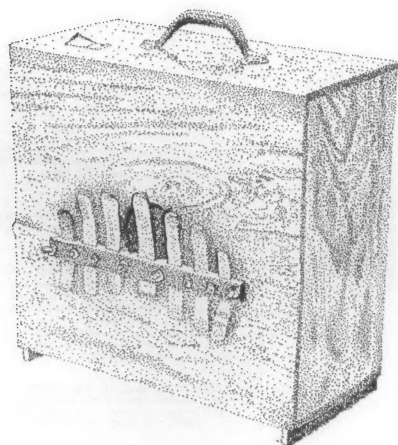
# EXPERIMENTAL MUSICAL INSTRUMENTS

## NOVELTY

In the earlier parts of this century, several small firms specialized in the manufacture of "novelty instruments" — enjoyable, easy-to-play musical oddities made for sale to amateurs, as well as to professional "novelty" musicians. In this issue of **Experimental Musical Instruments** you will find the first in three-part series of articles on novelty instrument companies, this one devoted to the Marx Music Company of Troy, Michigan. ... We start another 3-part series in this issue well, devoted to instruments and instrument makers from the island of Jamaica. The opening piece profiles Mr. Rupert Lewis, maker of drums, bamboo flutes, and the giant lamellaphones known in Jamaica as *rumba boxes*.



Also in this issue you'll find articles on Michael Masley, master of extended cymbalom technique; the sound hunter Martien Groeneveld; an insect voice synthesizer from Q.R. Ghazala, and the second half of Dan Senn's article on *non-linear instruments*. Plus there's the usual mix of reviews, letters, and so forth, and so on. Welcome to another issue of EMI.



Graphics on this page: Make the journey from kalimba to marimba and rumba box; from the old world to the new and back again. See the articles starting on pages 10 and 14.

Drawings by Robin Goodfellow.

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IT WAS GOOD to see EMI feature the two most significant early electronic instruments, the Ondes Martenot and the theremin, in the last few months.

I have learnt much more about the theremin and its inventor since the early 1980s, when I wrote the two entries on them (one co-authored) for the **New Grove Dictionary of Musical Instruments** which were listed in your bibliography (March 1993). In particular I had the opportunity to meet and hear Lev Termen and his daughter Natasha not only at the Bourges Festival in 1989 (when he was only 92, not 95!), but also in January this year, when they participated in a festival in The Hague, held partly at the Gemeentemuseum.

A few comments about the article by Ivor Darreg and Bart Hopkin. Of course the theremin is by no means the only musical instrument that is "played without being touched" — indeed in the same issue Qubais Reed Ghazala's Photon Clarinet is controlled by affecting the amount of light that reaches photocells, a procedure that was first used in 1931 in the Saraga-Generator (see my Grove entry on this). A number of other more recent "space-controlled" electronic instruments and sound installations have been controlled by these and by other remote sensors, including ultrasonic beams, wind and heat detectors, sonar, video cameras and so on. On the other hand, neither the Trautonium nor the Ondes Martenot can really be considered as "theremin-like": indeed the former does not even use a beat-frequency oscillator. It is perhaps worth emphasizing that the Ondes Martenot's actions of pulling on a cord to vary the plate position of a capacitor were, in the original version (see photo, September 1992) carried out standing up and with movements that were virtually identical to those used for the theremin, while its derivation from a radio receiver are even more obvious in its later versions. Here the cord is moved transversely by an index finger-ring, exactly like the mechanism of the station and wavelength indicator that is operated by the tuning knob of older radios (it can be seen inside many older receivers). The caption to one of the interior photos of the Ondes Martenot in Thomas Bloch's article describes a potentiometer for frequency control, but it looks to me more like one — if not two — variable plate capacitors.

Seeing father and daughter perform the theremin, what struck me most strongly about their technique was the use of fingering within static hand positions for adjacent pitches, which reduces the portamento effect. For some reason this is not mentioned by most people who write about the instrument, but it is an obvious technique, closely related to that of bowed and plucked strings, keyboards, winds and so on.

The spelling of Termen's name on the 1920s US patent as Leo Ssergejewitsch Thèremine is rather unfortunate. It was derived from a German Transliteration (adding a single grave accent — impossible in either language! — on the first *e* in Thèremine, instead of the two acute ones in the French transliteration). A typical form of transliteration from Cyrillic today would be something like Lev Sergeyevich Termen, and anglicized as Leon Termen. Similarly I haven't come across any other source for the inventor's allegedly abbreviated name of "vox" (from termenvox), and he certainly didn't mention this in his substantial entry on the instrument in a Russian-language musical dictionary some ten years ago.

Termen's history after he was summoned back to the Soviet Union (perhaps even abducted) in 1938 (not after the Second World War) was extraordinary. According to an interview published five years ago, he was first put in one of Stalin's worst labour camps and then, along with other Soviet inventors,

recruited for the war effort. He went on, among other things, to invent the first Soviet "bug."

As the only specialist on electronic instruments who was available at the Gemeentemuseum in January I helped to sort out the amplification system for the two theremins they had brought with them. Unlike the RCA version, the black-painted model that Natasha is shown playing in the article referred to in Keyboard (February 1992) has an internal amplifier, but the power supply (which she forgot to bring!) is external, while the second model — constructed by students — contains both.

Three updates that reflect the growing interest in the theremin. Robert Moog has recently developed a new model which combines analogue and digital circuitry (I have suggested elsewhere that our current second digital era — the first ended in the 1870s — may in fact be the prelude to one in which these two approaches are combined; wholly or primarily digital versions of the Ondes Martenot and Oskar Sala's Mixturtrautonium have also been completed recently. The most useful English-language source of information on Termen is: Bulat M. Galayev: "L.S. Termen: Faustus of the Twentieth Century". *Leonardo* 24/5 (1991), p.573-579. And what promises to be fascinating film on Termen and the theremin, made by Steven Martin in New York, is nearing completion; it includes footage of Termen talking at home in Moscow and revisiting New York after more than 50 years.

Hugh Davies

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and Enjoyment of Unusual Sound Sources

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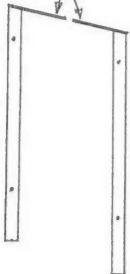
A SMALL AMENDATION to Ivor's wonderful theremin article ["Still Nothing Else Like It The Theremin" by Ivor Darreg & Bart Hopkin, in EMI Volume VIII #3, March 1993]. These days there are at least five other instruments which allow one to make music with no physical contact between the performer and the sound-making apparatus: Simon Veitch's 3DIS video-to-MIDI system; David Roqueby's video-based "Very Nervous" system; Godfried Willem-Raes' "holosound" motion-to-MIDI detection system; the video-based "Mandala" system; and Don Buchla's infrared-based "Lightning." I'm sure there are others, but they're all descendants of Mr. Termen's burglar alarm. The article with the circuit was also very useful. Herb Jercher, another composer/sound-sculptor down here has started making them in quantities. He's going to do a piece for multiple theremins and dancers later this year. And I'm thinking of using one thru a pitch-MIDI converter to control drum sounds, like I did in an installation last year.

Warren Burt

IN THE JUNE ISSUE of *Experimental Musical Instruments* you show a bass Tubulon built by David Barnes.

Here is alternative type based on some experiments I made with "bent" vibrating bars. You can take a metal bar, let's say about  $1/4" \times 2" \times 12"$  and bend it through an angle of ninety degrees or more at one or both of its nodal points. It will continue to ring normally when struck with only slight pitch change due to the bends.

Strike points



Excellent metal bars can be made by dividing the bar proper into its center section and tips, then joining its three parts using two machined metal blocks. Drawings of this bar "kit" will be included in my forthcoming book on the Marimba [to be titled *Wake the Marimba* - ed.] in the chapter "A Bar, is a Bar, is a Bar".

The drawing represents an end view through a "Tubarimba", show-

Anglebar Marimba with central T frame and mitered resonators

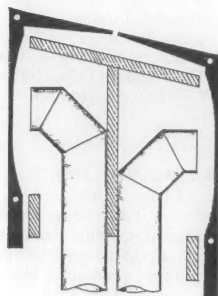


Fig. 63

Diagrams For Blake Mitchell's EQUARIMBA® and the proposed EQUARIMBA DOBLE®, shown in cross section through the bars (black), supports (cross-hatched) and resonators (shown as cylindrical piping).

Top right and left: two arrangements for angled bars on the EQUARIMBA®.

Right: a more elaborate arrangement for the proposed EQUARIMBA DOBLE®.

ing only the sounding tubes and their welded-on strike plates, since the plates add weight to their tubes, the nodal point at that end shifts outward a bit.

The plates close the tubes at one end, so there is the option of also using the tubes as their own resonators, even slitting the open ends of the tubes to form vibrating "forks". In that case, there are better ways to suspend the tubes than by cord through drilled holes.

The great advantage of vertically suspended tubes with strike plates is that the instrument requires less floor space, you have a flat striking surface rather than a convex one and very little reach is needed to move from the nearer to the farther rank of tubes. The two rows of tubes can be set up like a marimba keyboard ... or as a whole-tone keyboard, the row nearest the player containing the notes C, D, E, F#, G#, A#, C; and the upper row having C#, D#, F, G, A, B, C#.

In such a keyboard, adjacent tubes in the same row are separated by a whole tone, with the two rows pitched a half tone apart. Its principal virtue is that all major scales are played in only two patterns, depending on which row the scale begins in,

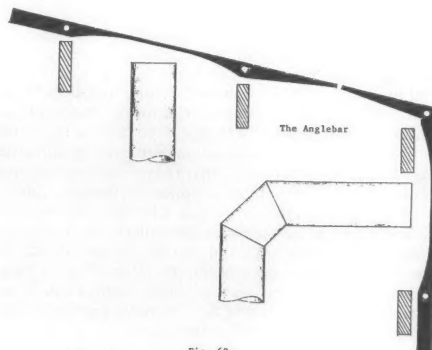
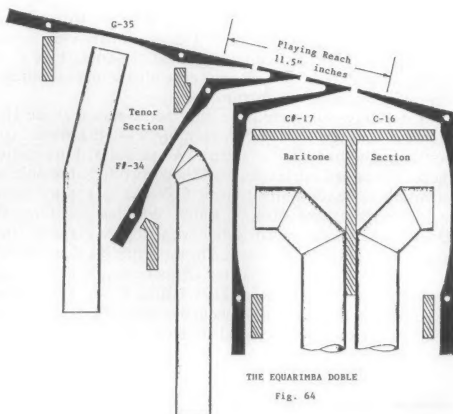


Fig. 62



THE EQUARIMBA DOBLE

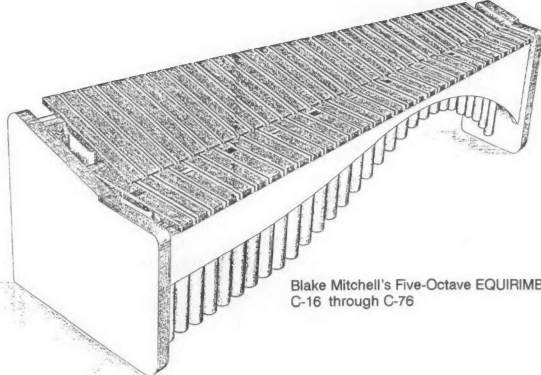
Fig. 64

and those two patterns are mirror images of each other in a direction away from the player. Thus if a piece is transposed by any number of wholetones, the playing pattern remains the same.

The accompanying drawings show my design for the EQUARIMBA® a five octave instrument using the wholetone keyboard, and a section through a proposed EQUARIMBA DOBLE® which combines in the same frame five octave baritone and tenor instruments, pitched 1.5 octaves apart. Both will appear in appropriate chapters in the book.

I hope some of your readers may take these ideas and run with them. I'd appreciate hearing about their results.

Blake Mitchell  
707/571-8794.



Blake Mitchell's Five-Octave EQUARIMBA®,  
C-16 through C-76

THANKS FOR YOUR COVERAGE of the 3rd Annual Chicago Invented Instruments Festival in the March 1993 issue. At the end of the article we announced our 1993 festival for April of this year. As it turned out, between the time we sent you the information and April, our plans changed for this year. As in past years the festival will take place near the end of October and again follow the "Instrument Invention and Sound Exploration" workshop at the Experimental Sound Studio in Chicago. This April (last month) we modified the focus of the workshop at ESS to place more emphasis on performance with invented instruments (the term that seems to have caught on in Chicago). I conducted this "Instrument Invention, Performance, and Composition" workshop along with Chicago composer Gene Coleman. Gene has considerable experience composing for unusual instruments. Many of my own instruments and instruments built by Chicago-area inventor Don Meckley have had prominent parts in his pieces. Additionally, Gene is an accomplished improviser and has extensive knowledge of 20th century scoring for unusual sound sources.

Everyone brought an instrument of their own construction to the first workshop session. Since several of our participants have taken the workshop before, many of these instruments have been 2 or 3 years in the making (e.g. Greg O'Drobinak's amplified percussion contraption trapazaws). Throughout the sessions we worked on a variety of approaches to structured improvisation, experimented with duos and trios in various models for improvised conducting and self-cuing by the ensemble as it played. Our evolving ensemble sound encouraged new refinements on the instruments.

The workshop concluded with a performance at the Hot-House in Chicago (during their monthly "Face the Music" concerts, curated by Gene Coleman). We performed five distinct pieces developed during the workshop: two full ensemble improvisations conducted by Gene Coleman, a copper tubing xylophone/trapazaws duet by Karen Westling and Greg O'Drobinak, a quartet improvisation with prepared tape by Greg, and a string ensemble conducted by the group itself as it played.

Participants this year included Diana Frole, Matthew Kopp, Greg O'Drobinak, Steve Rom, Dave Wallin, Karen Westling, and Brian Young. For information about the 1993 festival later this year contact the Experimental Sound Studio at (312) 784-0449.

Hal Rammel

## NOTES FROM HERE AND THERE

NUMBERING ERROR CAUSES MASSIVE CONFUSION, civic unrest: Due to a proofreading oversight, the June 1993 issue of *Experimental Musical Instruments* (the last issue) was mislabeled on the front cover as *Volume VIII #6*. It should have been identified as *Volume VIII #4*.

The mistake has led many subscribers to wonder if they missed *Volume VIII #4* and *5*. Please be assured that the issues were not missed. We are now on a quarterly publication schedule, producing four issues per year. The mislabeled June 1993 issue was the last (#4) of *Volume VIII*, leading directly to this current issue, *Volume IX #1*.

To avoid future confusion, subscribers who received the mislabeled June issue might want to cross out the #6 on the cover and put a small 4 there in its place.

EMI apologizes for the error and any confusion it caused.

A NEW JOURNAL DEVOTED TO WOODWIND MAKING, *The Woodwind Quarterly*, has just appeared this last spring. It is a most welcome arrival, since there's nothing else around specifically for wind makers casual & serious. Editor Scott Hirsch has done an excellent job of pulling together articles from a wide variety of sources and on a wide range of topics within the field. This first issue is over 130 pages. In it you will find interviews with individual makers as well as representatives of larger manufacturing firms, articles on aspects of wind acoustics and recent innovations, information on tools and other shop tips, book reviews, articles on historical wind instruments and early manufacturers, and quite a bit more. For more on specific articles, see "Recent Articles in Other Periodicals" in this issue of EMI; or, better: subscribe to *The Woodwind Quarterly* at 1513 Old CC Road, Colville, WA 99114-9526; price \$36 U.S. domestic; \$46 overseas.

FRANÇOIS BASCHET as author AND ALAIN VILLEMENOT as illustrator have joined forces to create *Klangobjekte*, a new book, written in German, on sound sculpture. It is designed to provide people with the tools for creative sound sculpture work, emphasizing acoustic and mechanical principles, materials and techniques. The ideas that appear here are wonderfully appealing, with lots of water and wind mechanisms and a strong sense of human interaction; and the illustrations — which fill most of



the book — show a light touch which is informative and often humorous. **Klangobjekte** is published by and available from Eberwald Verlag, Leutstettenerstraße 26 f, 8130 Starnberg, Germany.

## THE NEXT EMI CASSETTE IS HERE! (ALMOST)

From the Pages of **Experimental Musical Instruments Volume VIII** will be available by mid-August, 1993, and we are taking orders now. This is the latest in EMI's ongoing cassette series presenting the sounds of instruments that have appeared in EMI. The new cassette contains music from instruments featured in the four issues of EMI Volume VIII, September 1992 through June 1993. A panoply of different instruments appear, including:

Dan Senn's Scrapercussion instruments

Susan Rawcliffe's instruments based on pre-Columbian flutes

Ondes Martenot, played by Thomas Bloch

Ken Butler's Hybrid Instruments

Theremin, played by Ivor Darreg and/or Bonnie McNairn

Oliver Di Cicco's Mobius Operandi instruments

Bill Sethares' sounds of crystals and scrapyard percussion

Susan Alexjander's sounds of chemical light absorption spectra

Reed Ghazala's hindu-bent electronics

Musical pillars in Hindu temples, played by Matthieu Croset

David Barnes' instruments for **Percussion Symphony #1**

Hal Rammel's Sound Palette

... and possibly two or three more, not yet confirmed at the time of this writing.

— All good stuff!

The Volume VIII tape is available to EMI subscribers for \$8, and to non-subscribers for \$10.50. (That includes U.S. airmail or overseas surface rate shipping. Add 20% for overseas air.) Of our earlier cassette tapes, Volumes II, III, VI and VII are still available, at the same price. Checks should be made out to Experimental Musical Instruments at PO Box 784, Nicasio CA 94946 USA.

IN THE MARCH ISSUE of EMI, there was reference to Dan Senn's *Flutter Moths* — an arrangement in which metal washers are placed at the top of a vertical threaded rod in such a way that they spin their way slowly down, producing an intriguing sound and visual effect. Dan describes them further in his article in this issue. Meanwhile, François Baschet has sent these notes and photographs on his experiments with similar arrangements:

*Flutter moths*: To hear the sound we attach, at each end of the threaded rod, a cardboard (or metal) sound radiator with a conical shape. The cone plays the role of an amplifier and of a stand. The picture on the far right is the simplest solution. This photo was taken around 1968 at the Waddell Gallery in N.Y.C. Mrs. Forbes, of the Forbes Journal bought one or two.

The smaller picture is the same principle, but the threaded rods are the spokes of a turning wheel. When you spin the wheel, about 100 washers cascade along the threads. This sculpture has seen sold to a Chicagoan Collector at the Chicago Arts Club in 1969. Washers have to be light otherwise they wear out the threads after a couple of years.

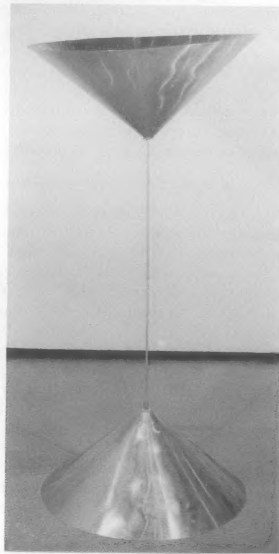
IN EMI'S MARCH 1993 ISSUE we ran an article entitled "Wind Instrument Toneholes, Part 1", written by myself, Bart Hopkin (with lots of help from others). In that article I gave a pair of generalized formulas for locating toneholes in wind instruments in order to obtain desired pitches. The formulas were taken from the 1976 edition of Arthur H. Benade's *Fundamentals of Musical Acoustics*. In the article, I presented the formulas with a disclaimer: in my own experiments, the formulas had produced poor results — i.e., their predictions did not reflect very well the actual situation on instruments I had made. However, a new edition of the Benade book has recently appeared, and thanks to a tip from its editor Douglas Keefe, I have belatedly discovered that it contains a revised version of the formula. Only one formula is presented in the new edition (the more useful of the original two), and while I have not had the opportunity to try it out, it is altered in a way that will at least move the results in the right direction to correct the inaccuracy I encountered earlier. Here, then, is the revised formula, preceded by some explanatory notes. For more complete information, you can go to the source: *Fundamentals of Musical Acoustics* by Arthur H. Benade, Dover Publications Inc., New York, 1990. The formula yields a value for the tonehole correction  $C$ , being the distance nearer to the mouthpiece that the hole should be located as compared to the point at which the tube would have to be cut off to yield the same pitch. The formula should, in theory, work well at low frequencies. It becomes slightly inaccurate through the mid-range (the results err increasingly on the low side), and should only become seriously inaccurate near the highest pitches in the instrument's spectrum (which usually are present only as overtones anyway).

Where  $C_{low}$  is the tonehole correction factor (described above) for pitches through the low and mid-ranges, and

Below: Baschet sound sculpture (from the Baschet Retrospective, Chicago Arts Club 1969) using a technique similar to that described by Dan Senn. The superimposed arrow points to a wheel. The spokes are threaded rods with cascading washers.

Right: Another cascading washers piece by the Baschets. If you turn the sculpture upside down the washers travel from top to bottom. The cones contribute to the sound amplification and static stability.

Photo by John D. Schiff



$d_p$  is the internal diameter of the pipe at the location of the primary hole, and

$d_h$  is the diameter of the primary tonehole, and

$s$  is 1/2 the distance between the centers of the primary tonehole and the next one below it (i.e., the distance between tonehole centers is  $2s$ ), and

$t$  is the thickness of the tonehole and  $t_e$  is its "effective thickness," which can be approximated as  $t_e \approx t(0.8 d_h - 0.5(d_h^2/d_p))$ , THEN

$$C_{low} \approx s\sqrt{1 + 2(t_e/s)(ab)^2 - 1}$$

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THE JUST INTONATION NETWORK has just published **The Just Intonation Primer**, a complete introductory text on the theory and practice of just intonation, by David Doty. For years people have commented on the need for such a work and bemoaned its absence — and now, here it is. Cost of the primer is \$7.50 to the general public, \$5 to Just Intonation Network members, and free to anyone who starts a new memberships in the Just Intonation Network at \$15. Contact the Just Intonation Network, 535 Stevenson St., San Francisco, CA 94013, phone (415) 864-8123.

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EMI RECENTLY RECEIVED some invaluable help in researching one of our coming articles from Fred Dahlinger, Jr., of Circus World Museum in Wisconsin. Much of what is to be seen at Circus World is potentially interesting to EMI readers, so I asked Mr. Dahlinger to send some information. He writes:

The Circus World Museum is owned by the State Historical Society of Wisconsin. Located on the site of the original winter quarters of the Ringling Brothers Circus, it is a living history museum featuring live demonstrations during the nominal May 1 to September 15 season. Presentations include a full circus and magic show, train-loading demonstration, daily street parade, interpretive displays, etc. There are daily demonstrations of unusual musical instruments used by circuses, including steam and air calliopes, Deagan organ chimes and unafon, rattles, rub chimes, sleigh bells and others. The Circus World Museum also operates the Robert L. Parkinson Library and Research Center, a year-round archive operation open to the public. It houses the largest collection of circus documents and ephemera in the U.S.

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IN A LETTER APPEARING in EMI's June issue, Duane Schulz described a most unusual wind instrument he has come across, and asked if anyone could supply information on its history and origin. It has a single mouthpiece leading to eight separate flared horns ranging in length from 16" to 36". The player controls which of the horns sounds by means of a set of trumpet-like piston valves. At the start of each horn is a single metal beating reed.

Rick Elmore (known also as Professor Gizmo, the one-man band) recognized the instrument. He reports that it is known as a *Schalmei* (the German word for *shawm*, apparently borrowed for this purpose) or, alternatively, as a *Martintrompete*, and that it is listed under the former name in Sibyl Marcuse's **Musical Instruments: A Comprehensive Dictionary**. Marcuse indicates that it was manufactured by Martin (presumably the French firm J.-B. Martin). Rick has heard, by word or mouth only, that the *schalmei* was a favored ensemble instrument for Nazi Youth.

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ALSO IN THE JUNE ISSUE Mike Hovancsek drew readers' attention to a kid's toy that makes some great sounds. It consists of a plastic tube, a little less than an inch in diameter and about 18" long, with an air-tight cap at one end. Inside is a plug that slides along when the tube is tilted. Because of the sealed end, the sliding causes air to pass through a hole in the plug, which sounds a reed located within. Between the effects of the shifting tube resonances as the plug slides and the variations in air pressure resulting from different shaking and tipping motions, you can get a wonderful array of sighing, moaning, laughing and crying sounds.

In the time since Mike's letter appeared, what was an intriguingly obscure item has gained popularity, showing up as a party favor at a lot of birthday parties, and, inevitably, finding its way into the hands of a lot of the sort of people who read EMI. One of those people, Darrell De Vore, adds these comments:

Regarding the toy plastic tube sound devices described by Mike Hovancsek in EMI letters section (June, 1993), coincidentally, I was introduced to one of these tubes a day or two before I read Mike's letter. Next day, I went to my local toy source, "Aunt Julie's" in downtown Petaluma, and happily discovered a box full of these tubes which were advertised as "Magic Bars" on the outside of the box. They were manufactured in Taiwan and priced at 98 cents each. The store manager told me they had been around for a few years and were also known as "groan tubes." Other sources have mentioned the name "giggle sticks."

These tubes are sixteen inches long by 7/8 inches diameter and contain a plastic cylinder 3 cms by 2 cms with small metal reeds fixed at one end. This cylinder is the sound source and can be examined by removing one of the tube end caps.

I wanted to find out if these reed cylinders would sound in longer, readily available tubing and was delighted to discover that 3/4 inch PVC pipe accepted the reed cylinder with ease. Plugging one end of the pipe with duct tape, I dropped the cylinder into the open end and it worked. This particular PVC pipe length was 109 inches long and I was expecting a big change in sound. However, although the longer tube did give the reed a deeper throat from which to sound, making the overall sound seem lower, and the sustain of the sound definitely longer, the fundamental reed vibration was unchanged. Some magic occurred but could only be perceived with ear very close to the open end of the pipe.

Trying a different approach, I cut the pipe into two lengths 65 inches and 44 inches respectively and inserted two cylinders from the toy tubes. Taping the two pipes together so they would work in unison, I was able to hear their sounds simultaneously. There was a subtle difference in the two sounds, but nothing as distinct and harmonious as the pipe-length proportions would seem to imply. If one could make or attain reed cylinders that had varying frequencies in consonant relationship to the various lengths of tubing, that would greatly expand the musical potential of this clever toy. The longer PVC pipes do give a deeper sound to the reed and because of the longer sustained sound attained, some new techniques in manipulating these bizarre sounds are possible. But the longer, heavier PVC pipe also poses some problems of physical manipulation in space.

In another experiment, I used one of the reed cylinders as a mouthpiece attached with tape to one end of a former fipple flute of PVC, and found that bowing produced incredible screaming multiphonic sounds with a wide frequency range but with absolutely no control via fingerholes. The reed has super sensitive responses to breath, leaping from low to high with very little increase in velocity.

Overall, these sounds have limited musical uses, but, like all toys, they are a lot of fun to play with and expand the imagination until I grow up.

Darrell De Vere

TONY BLANTON recently sent to EMI a copy of his video cassette, **The Lazy Acres Racket Maker**. Tony makes music using commonplace materials. In the video he plays well-known, old fashioned melodies using such sources as balloon squeaks, boot strings (with the boots still on), and plastic bottles, as well as simple homedades using sticks, nails and string, not to mention musical glasses and saw. The effect is quite comical as he pulls out one improbable noise maker after another, and as you, the listener, recognize the familiar tunes behind the less-than-perfect intonation and the twanging, honking and tooting tone qualities. Among many other skills, Tony is a master of edge tone embouchure. He can get a clear tone blowing over just about anything, and he gets controlled pitches out of what surely must be some very unstable air chamber resonances — as he demonstrates by playing "The Farmer in the Dell on three large nuts (of the nuts and bolts variety). With the three nuts stacked one on top of the other to form a short air column down the middle, he blows over the top edge for the first line — *The farmer in the dell* — then rapidly removes one to shorten the column for the next line — *The farmer in the dell* — then removes the next — *Heigh-ho, the derr* — replace one — *ee* — replace another — *oh ...* — and so forth through the tune.

**The Lazy Acres Racket Maker** video is available from Tony Blanton at 536 Crow Road, Shelby NC 28152 for \$15 + \$2 shipping and handling. A cassette tape with some of the same music is available for \$5 + \$2 shipping and handling.

THE TOPIC OF JEW'S HARP comes up often in the pages of **Experimental Musical Instruments**, and the question arises: should we be using some other name for this class of instruments? The term *Jew's Harp* can be seen as unfit for the purpose, since the instrument has no special association with Jewish culture or religion, and the specious ethnic association troubles some people. On the other hand, one could argue the other point of view by saying, "It's no worse than 'French Fries'"; if anyone knows and accepts the term, why create confusion by trying to change it?"

The term *Jew's Harp* has been around at least since the 16th century (according to the **Oxford English Dictionary** and other sources). More recently some people have used *Jaw's Harp* or *Jaw Harp* as an alternative. But *Jaw Harp* doesn't appear to have any historic foundation (according to the **New Grove Dictionary of Musical Instruments**), and as a descriptive term it is inaccurate. Meanwhile, mouth-resonated lamellaphones appear all over the world in a bewildering variety of forms, and there are countless local names. Many of these other names might be more suitable in some respects, but they have the problem that outside of their habitat they have no currency. Few people will know what you're talking about when you use them — a situation that is contrary to the purposes of language.

Professor Frederick Crane, of the Jew's Harp journal **VIM** (short for **Vierundzwanzigstel Jahrschrift der Internationalen Maultrommelvirtuosengenossenschaft**) has suggested using the term *trump* as a suitable and more ethnically

neutral alternative. *Trump* was used long ago throughout England, and is still used to refer to Jew's harps in North England and Scotland. It may once have had linguistic associations with *trumpet* and related terms referring to horns, or with the German *Trommel* (drum). Those connections have been at least partially shed by now, leaving the term somewhat, though not entirely, free of extraneous associations. It does have the disadvantage mentioned before, that it is not widely known and understood.

Gordon Frazier, editor of the Jew's harp journal *Pluck*, actually took a poll of his readers on the question of names. Many were content to stick with *Jew's harp*; *jaw harp* came second; a smaller number preferred *trump*; and there were a few more obscure also-rans. Gordon questions the value and efficacy of attempting to shape the language prescriptively (as by trying to impose a new term rather than accepting natural developments in usage). He suspects that *jaw harp* is gaining currency and will eventually be the standard term. He himself has been using *Jew's harp* to refer to American and European instruments of metal, *jaw harp* as a generic, and various local terms to refer to other specific variant types.

**Koukin** is a Japanese journal on the topic edited by Leo Tadagawa. Here the issue is moot, or nearly so, since the Japanese term *koukin* is used primarily (along with local names where appropriate). In the limited portions that are in English, *Jew's harp* does appear.

In all this discussion, no one has suggested enforcing a ban on the word *Jew's harp*. But at least we know the alternatives.

---

## SOUND STORIES #1

### A Video by Phil Dadson

This 60 minute video features 14 of the foremost American experimental musical instrument builders, many of whom are also composer/performers: Skip La Plante, Ivor Darreg, Lou Harrison & Bill Colvig, Susan Rawcliffe, Dean Drummond, Bart Hopkin, Tony Pizzo, Dan Senn, Joel Chadabe, Tom Nunn, Richard Waters, Darrell Devore and William Eaton.

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## TUMBAS, RUMBA BOXES, &amp; BAMBOO FLUTES: Caribbean Instruments by Rupert Lewis

Article by Bart Hopkin

*This is the first in a series of articles on Jamaican instrument makers that will be appearing in **Experimental Musical Instruments**. The second, on the late bamboo saxophone maker "Sugar Belly" Walker, will appear in the coming issue, and a third, on a contemporary Jamaican idiophone zither known as bamboo and a traditional one called benta, will follow in the next.*

Popular music in Jamaica for many years has been dominated by the instruments of North American popular music -- electric guitar and bass, the drums of the trap set, piano or electric organ, and more recently synthesizers and electronic drum machines. With that instrumentation, the ska, reggae and dance hall styles emerging from the island have proven immensely fertile and popularly successful. Rare now are the unamplified calypso, mento and quadrille bands of an earlier era.

Yet mento and calypso musicians can still be found here and there, in rural districts and sometimes in tourist places. In addition to guitars and the occasional saxophone, there was a place in these older Jamaican popular music styles for several instrument variants not seen up north. There were various and sundry types of shakers or scrapers, and hand-played, single-headed long drums both large and small. There were banjos -- indigenous to some Caribbean islands just as to the U.S. -- made, as often as not, by local craftsmen. There were sometimes fifes and pennywhistles, locally made of bamboo or other available tubular materials. And, down in the bass, there was the rumba box -- the big kalimba that appears in several of the islands.

As the older music styles have given way to the contemporary, the number of people making the traditional instruments has dwindled. One of the few makers still active is Rupert Lewis. I visited Mr. Lewis in Kingston, Jamaica, on several occasions early in 1992.

Rupert Lewis was born in Kingston. As a young man he learned woodworking and cabinetry. At the same time he cultivated an interest in music and instrument making. It began, when he was a child, with home-made plucked string instruments made with herring tins and fishing line. Later he made himself a ukulele, teaching himself to play and eventually doing a lot of performing around Kingston. He took up the guitar sometime later, when someone who had brought a guitar to him for repair, deciding that Mr. Lewis would make better use of it than he, left it with him to keep. He studied music informally with teachers around Kingston, and later through an overseas

correspondence course from an institution called The United States School of Music. His growing reputation as a musician led to work on a tourist boat. For several years he worked at sea and in Miami, both in music and cabinetry. It was when he returned to Kingston that his instrument making came to the fore, as he supplied instruments to individual customers and to the island's leading music store.

Mr. Lewis still lives in Kingston today. He builds instruments on order, continues to work in cabinetry, and plays music whenever the opportunity arises.

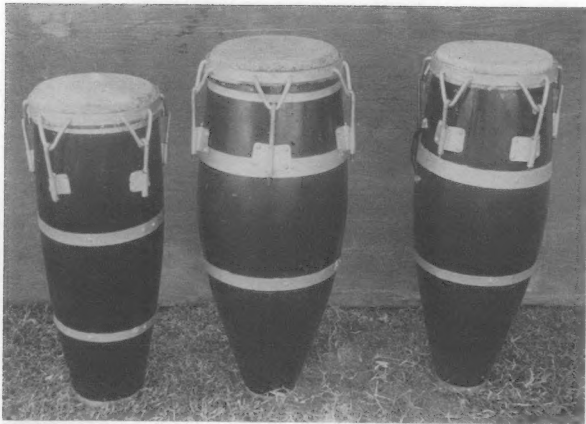
## DRUMS

So what has Rupert Lewis made since that early ukulele? His primary instruments have been drums, rumba boxes and bamboo flutes. The bulk of his business in recent years has been drums -- primarily *tumbas*, a type similar in design to what most people think of as conga drums. These he makes in a range of sizes, along with smaller bongo drums.

Mr. Lewis' father, in fact, had been a maker and player of drums. "When I started the drums," Mr. Lewis says, "it was an antiquated type of drums, with rope and things like that, like the African style of drums." These traditional laced drums had their heads tuned by *twitching* -- that is, inserting short pegs of wood between the laces and giving them several turns so as to twist two segments of the rope lacing together. The more turns, the greater the pull on the head. Later he graduated to metal tuning hardware in the style of contemporary conga drums.

His preferred wood for drum bodies is an aromatic hardwood known in Jamaica as cedar. (It is substantially harder and heavier than the wood called by the same name in the U.S., and appears to be a different species entirely.) To create the outward curvature in the sides of the *tumbas*, Mr. Lewis must cut the staves on a band saw, and then bevel the edges so that they fit together in the circular barrel shape. The Jamaican cedar has become harder to get in recent years, and so Mr. Lewis has turned increasingly to oak salvaged from barrels used in shipping. The barrels already have the slightly convex silhouette, eliminating the need for the band saw. But the staves must be narrowed and the angle of the bevel reset to allow them to form the narrower drum. To help in putting the pieces together, he uses a pair of circular metal templates, one sized for the top of the drum body, and one for the narrower bottom. Mr. Lewis takes great pride in the perfection of the wood joints in his drums, as well as the levelness of the rim.





Drums by Rupert Lewis

On most of Mr. Lewis' drums, the opening at the lower end is considerably narrower than what one might see on a conventional conga drum. In theory this should lower and focus the resonance frequencies of the enclosed air, making for a lower tone, with a strong but narrowly defined air resonance. Subjectively speaking, I found this to be the case with Mr. Lewis' drums: there seemed to be an extraordinarily deep, rich air resonance to the tone. He explains that he noticed the narrow opening on some of the Cuban drums whose tone he admired, and so incorporated the idea in his own drums to good effect.

For small drums Mr. Lewis uses goat skin heads. For larger drums, whenever possible, he uses muleskin. Muleskin, he argues, is less stretchy than cowhide. It holds a tuning better, produces a clearer tone, and resists tearing. He prepares his own skins, with a series of soaking and cleaning processes.

## RUMBA BOXES

African lamellaphones are known in the west by the nick-name "thumb pianos", as well as by the names of African variants like kalimba, mbira and sansa. Such instruments never took hold in the United States, except in later years as African imports. But in parts of the Caribbean and Latin America they did -- particularly, for some reason, in larger bass forms called *marimbula* in Columbia and Puerto Rico, *marimba* in Haiti, and, in Jamaica, *rumba box*. A big lamellaphone can have a wonderfully full, oomphy sound, and a well-made rumba box carries the bottom of an acoustic dance band quite satisfactorily. Couple the rumba box with a guitar or banjo to play chords and some sort of percussion to keep the beat, and you have a very appealing little rhythm section. The rumba box's tone is not as loud as a string

bass, and the pitch generally is not as clear, but the effect is more fat, bottomy and rhythmic. Most early rumba boxes had five or seven keys, and they were not always very deliberately tuned. To the extent that they were, the idea was to allow for triadic bass lines.

I was unable to get a photo of any of Rupert Lewis' rumba boxes for this article, but you can get a some sense of what they look like from the photo in Richard Graham's article following this one. Rupert Lewis makes rumba boxes in a range of sizes, including smaller kalimba-like instruments for children. A typical size for the bass instruments might be 22" wide by 18" high by 9" deep. The local cedar is the preferred wood, especially for the soundboard, at about 3/16" or 1/4" thick. Plywood may be used for the back and sides if sufficient cedar isn't available. A soundhole near the center of the face is usually about 3" across.

Most of Mr. Lewis' rumba boxes have seven keys. The keys are made from the drive springs of old gramophones or large old pendulum clocks, typically about 3/4" wide and less than 1/16" thick. Needless to say, it's not easy to locate sources of old gramophone springs these days.

Mr. Lewis keeps a cherished supply, and is always on the lookout for more. The bridge that supports the keys is made up of two strips of wood or metal. The two strips are placed one on top of the other, with the keys sandwiched in between. Bolts pass through the bridge in the spaces between the keys. The bolts can be loosened to allow for sliding the keys further in or out, effectively lengthening or shortening the vibrating portion for tuning purposes.

## FLUTES

Diatonic sideblown flutes have figured in many of the older Jamaican music styles. Not only did they have a role in a lot of the mento, calypso and quadrille music mentioned earlier, but they were central too in the jonkanoo dancing that traditionally

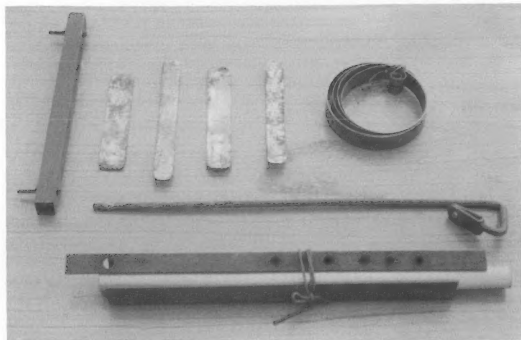
A mento/calypso ensemble: Rupert Lewis, guitar; Dr. Lloyd A. Cole, drums; Fraser Warren, tenor saxophone.





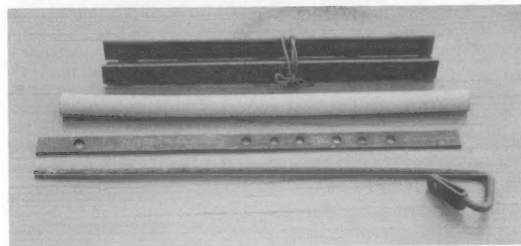
## THE GIANT LAMELLAPHONES: A GLOBAL PERSPECTIVE

By Richard Graham



ABOVE: Rumba box hardware, and flute-making hardware. In the top row, left to right, are an assembled rumba box bridge (two abutting wooden pieces with bolts), four spring steel keys, and a coiled spring from which keys can be made. Below are a poker for burning flute holes, and the assembled hole-placement template with a flute body waiting inside.

BELOW: Components of the flute-making hardware disassembled.



happened in both city and country around Christmas time, as well as other localized traditions. An irresistible style of playing evolved in the island, with long, high-flying lines of rapid, highly ornamented melody full of a characteristically Caribbean sort of rhythmic phrasing.

Mr. Lewis' flutes are made from bamboo, with toneholes and blowhole made by burning through with a poker. For accurate location of the toneholes, he has made the iron template shown in the photograph above. The template consists of a trough-shaped bottom piece, which holds the flute in place, and piece of bar stock that fits over the top. This top piece has holes in it, sized and located correctly for the six fingerholes and the blowhole. Long ago Mr. Lewis copied the hole sizing and spacing from a commercially made flute onto this iron template, and it has allowed him to make accurate and well tuned flutes ever since.

The older Caribbean instruments are still with us, though they are not as common as they once were. Mr. Rupert Lewis, along with a very few contemporaries, continues to make them, experiment with and improve them, and play them. The sound is as sweet as ever.

*For more information on Rupert Lewis' Caribbean musical instruments, contact him at 33A Hope Road, Kingston, Jamaica, West Indies.*

Special thanks for assistance with this article to Marjorie Whyllie and Carmen Verity.

African lamellaphones (often erroneously called thumb pianos) appear in a variety of sizes and shapes, being constructed from locally available materials in traditional and experimental forms. They may possess metal, raffia, or other vegetable lamella, attached to a board, and often equipped with a box, calabash, or tin can resonator. At times various materials such as bottle tops or shells may be attached as rattling devices, lending the instrument greater amplification as well as providing a subsidiary buzzing timbre. Lamellaphones enjoy a wide distribution in Africa, especially in the Bantu-speaking areas across the center of the continent.

Box-resonated lamellaphones with dimensions exceeding 18" are rare in Africa, appearing mainly along a limited area of the Gulf of Guinea. In the New World, the giant lamellaphones are numerous, examples including the Jamaican rumba box (see Bart Hopkin's article in this issue), with other variants of this complex occurring in Cuba, Curaçao, Colombia, Dominican Republic, Haiti, Puerto Rico, and Venezuela. In most of these areas the large box-resonated lamellaphone is known as *marimbula*, an appellation deriving from the Bantu term "marimba", meaning several notes, with the addition of a Spanish suffix "-ula" (Kubik 1979:37). Other instruments in this trans-Atlantic complex include the *banja* of contemporary Trinidad, and some historical examples occurring in 19th century Brazil and Argentina.

In Africa, the giant lamellaphones are found among the Yoruba in Nigeria, the Fon in Benin, and the Vai of Sierra Leone. The late Collin Walcott, of the ECM recording group CODONA, kindly allowed me to examine his tinned-resonated giant lamellaphone which he said came from Cameroon (personal communication 8/27/79). The lamella on Walcott's instrument were hewn from umbrella spokes. He held and played his instrument like the Yoruban *agidigbo* lamellaphone played in Ejigbo, suspended from a neck strap with the lamella ends facing upward, depressing them with the index and middle fingers of both hands, the traditional West African playing technique. The largest lamellaphones, such as the Yoruban *agidigbo*, the Bai *kongoma*, and the *prempensua* of the Akan must be held in the lap to be played.

Complex issues regarding the ultimate origins of the giant lamellaphones have yet to be resolved. In a recent conversation with the Austrian social scientist Gerhard Kubik, he suggested that it is now a strong possibility that the giant lamellaphones were a Caribbean innovation, being introduced into West Africa in this century via the maritime trade (personal conversation 8/14/91). If these giant lamellaphones were only recently repatriated to Africa, it seems that they may have been an adaptation of the smaller, handheld lamellaphones that Bantu-speaking slaves played in the 19th century Caribbean (Caballero 1852:60, Goodman 1873:124). Using original Bantu models as a cultural template, Caribbean slaves constructed these New World



innovative instruments with fewer lamella, perhaps only three to ten spring steel tongues, tensed with Western hardware over larger resonators such as packing crates, the available materials in the islands then. The folklorist Harold Courlander discovered extant examples of both the handheld and giant models during his 1941 field work in Cuba (Courlander 1942:239). Still other evidence exists pointing towards a New World Bantu slave origin. A characteristic playing technique associated with Central African *likembe* and other handheld lamellaphones is replicated in Colombian marimula performance, one hand passing underneath the bent knee of the seated player (List 1966: Figs 1 & 2).

Recent studies of the cultural impact of repatriated African slaves and free men suggest that the trans-Atlantic African dialogue has been grossly under appreciated, cf. the influence of African-Cuban popular music over musical practices in Central Africa.

It is to the inter-American influence of the African-Cuban *son* musical form that we may turn to reconstruct the diffusion of the giant lamellaphones. With the advent of this music in the early 20th century, the orchestration of the *son* conjuntos was replicated through the medium of records, films, and touring groups in Jamaica, Puerto Rico, Colombia, and Argentina (List 1966:55, Pollak-Eltz 1978:29). As an associated phenomenon, the giant lamellaphone spread with the *son*'s international popularity, doubtlessly reinforced by existing lamellaphone traditions in some areas. Remarkable is the adaptation of the Bantu/Spanish term, "marim-bula", in English and French speaking areas, suggesting a central point of diffusion — Cuba. The stability of playing techniques and musical functions also points to that island. Joseph Bennett of the *Jolly Boys*, a contemporary Jamaican mento group, plays his rumba box in a manner identical to the marim-bula players of such 1920's Cuban *son* sensations as the *Sexteto Habanero*. The term "rumba" box refers to a later Cuban dance form of Bantu derivation.

Inter-island migrant workers also helped to spread Cuban musical instruments and performance practices throughout the Caribbean.

A second possibility should also be considered, focusing on the relationship between 19th century Brazil and Nigeria. An old wrestling game known in Yoruban as "gidigbo" was accompanied by the *agidigbo* lamellaphone in Nigeria, although how long ago is now known (Kubik 1979:31). Our first depiction of a box resonated giant lamellaphone occurs in Rio de Janeiro, Brazil circa 1840. This sketch, titled "Tanzende Neger" by the expatriate artist Paul Harro-Harring (shown below), depicts a Brazilian wrestling game accompanied by a lamellaphone identical to the Yoruban *agidigbo* and a fiddle identical to the Yoruban *goge*. The large maritime trade and transAtlantic migrations between Brazil and Nigeria in the 19th century (Turner 1942:55) facilitated a cultural dialogue that may have aided in the diffusion of the *agidigbo* lamellaphone and the associated wrestling game, *gidigbo*. But in which direction did it migrate? The one way approach of the "Roots" paradigm fails to address significant African Diasporan developments which in turn profoundly impacted African cultures. At this juncture, further research is required. We do know that central African lamellaphone models were extremely popular in 19th century Brazil (Theirmann 1971:90-94), and these may have served as a model for Yoruban-Brazilian developments which were eventually exported back to Africa.

In conclusion it is possible that many of these scenarios might prove true, the complexities of trans-Atlantic African culture are never reductable to an either/or solution. The innovations of African peoples on both sides of the Atlantic need to be better understood and appreciated. Clearly these cultures are incredible dynamic as evidenced by such organological experiments as giant lamellaphones with over five octaves of lamella

BELOW LEFT: Jamaican rumba box, from the collection of the Jamaica School of Music, maker unknown. Thanks to Derrick Johnson of the Jamaica School of Music.  
RIGHT: Detail from Paul Harro Harring's "Tanzende Neger," showing *agidigbo* lamellaphone and *goge* fiddle. From *Tropical Sketches of Brazil*, circa 1840s.



in Cuba and Haiti, innovative resonator designs in Puerto Rico, including one modeled after a European upright Bass, and electric *agidibos* of some modern Nigerian Apala groups. The changing nature of trans-Atlantic African organology promises a bright future of continuing experimentation, and I look forward to each new development.

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## Tools & Techniques

### MUSIC BY MAILORDER

By Mike Hovancsek

(with assistance from Susan Cihla, Bart Hopkin, and John Cieciel)

A while back I mentioned to Bart Hopkin that EMI readers might enjoy having a fairly comprehensive list of mail order companies that specialize in unusual musical instruments. A couple of months and over \$100.00 in phone calls later I had enough catalogs to stun an ox.

To get hold of some of these people/businesses I had to wade through a labyrinth of phone lines and answering machines. My experiences ranged from awkward (when I told him I was writing an article about various mail order companies, a man from the Kelischek Workshop demanded to know what right I had to "make judgments" about his company) to interesting (someone from Silver Bush Productions played a didgeridoo over the phone for me).

Not all of the companies that I contacted bothered to respond to my phone calls and letters. Assuming that these companies would be equally unresponsive to EMI readers, however, I didn't include them in this article.

There are also companies out there that I may not be aware of or companies that simply were not able to send me information in time for me to include them in this article. I do feel, however, that this listing includes a pretty nice selection of impressive mail order companies. Perhaps additional listings will be warranted in the future.

This article begins with a couple of sources of mail order instruments which I chose to examine in a little more detail. The remainder of the article is a listing of companies that includes the company name, address, a vague description of the products available, sample prices, and any other information that appeared to be relevant.

It should be pointed out that the prices are only listed here in order to give an idea of how financially accessible some products may be. Price, in and of itself, is not a reliable indication of instrument quality.

O.R. GHAZALA  
3325 South Woodmont Ave. Cincinnati, OH 45213

Reed Ghazala is a familiar name in the pages of EMI by now. I urged him to make some of his incredible and unique instruments available to the public via mail order. He originally listed the two instruments detailed below as the only instruments that he was willing to make available. Later, he decided to write a series of articles in EMI at the end of which he will be making the featured instrument available for sale at reasonable prices.

The Jabberbox is an instrument Reed can make out of a modified Speak-N-Spell or Speak-N-Math. The Jabberboxes come in a couple of price ranges and models; if the purchaser provides the Speak-N- whatever, it costs \$25.00!

The cost rises only slightly, \$35.00, if Reed has to find the Speak-N-etc. A deluxe model including a couple of extra features costs \$70.00

The Jabberbox works like an ordinary Speak-N-etc. unless a switch is flipped which causes it to spew out streams of nonsense "vocal" sounds. The deluxe model also includes a switch that breaks the sound into more abstract sequences of chirps,

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crackles, and pulses. It also includes a hold switch (to loop a group of sounds) and a dial that modulates the rate that the sounds/loop move.

Reed sent me a deluxe model of the Jabberbox. I have used it in a couple of performances and find that it never fails to confuse and fascinate my audiences.

Reed also has an instrument called a Photon Clarinet which is available for sale. For \$250.00 this instrument includes two sensors; one that sweeps pitches like a Theremin and one that steps the pitch. Both sensors can be modulated together to create a range of bent and stepped pitches. Other features include volume control, an internal speaker, line-out, power LED, five controls and a psychedelic finish.

Keep an eye on Reed to see what other fascinating things he will be making available in future issues of EMI.

#### JOHN HERRON

4022 South State, Salt Lake City, UT 84107

John sells custom designed, hand crafted instruments including a multi-tonal bell plate (\$40.00 for a small one) which I have the fortune of owning. The Multi-tonal bell plate is a sheet of brass that comes with a series of jagged cuts made into it. The cuts enable it to produce different pitches depending on where it is struck. It also comes with a striker. This simple instrument sounds great; it produces a really bright ring when it is struck with a hard striker (like the one supplied). It also produces very different sounds depending on the physical properties of the mallet being used. I would love to own a HUGE multi-tonal bell plate some day.

John also sells spinning bells (triangular sheets of brass suspended from a string that create a phase-shifted sound when they are spinning) and bull roarers.

Since John makes these instruments specially for the individual customer, I would imagine he could make them based on the specifications of the person placing the order. For the same reason, prices vary according to the time/material required.

#### RICHARD WATERS

1462 Darby Rd. Sebastopol, CA 95472

Another familiar name in the pages of EMI, Richard Waters, designs and builds some of the most unique and beautiful instruments in the world. His waterphones are sturdy metal canisters (for lack of a better word) that contain water. Metal rods that protrude out of the body can be struck or bowed to produce very clear, incredible pitches. By tilting the body, the pitches can be altered. This instrument can also be struck at other locations on the body in order to produce different timbres. The waterphones are incredible sounding instruments that are a lot of fun to play.

Other instruments designed and built by Richard Waters include water gongs, bullroarers, friction bird calls, and a lot of instruments that are completely original and elegant in their design.

A few sample prices: 7" waterphone \$310.00, water gong drums \$55.00 (and up), water tongue drums (large) \$85.00

#### AMERICAN SCIENCE AND SURPLUS

601 Linden Place, Evanston, IL 60202

This company doesn't sell musical instruments. It does, however, sell a HUGE selection of seemingly random doo-dads making them a valuable source for instrument builders. The catalog includes steel wire, glass rods, rubber balls, piezo pick-

ups, velcro, padding, motors, electronic components, mirrors, and many, many more interesting items at fairly reasonable prices. This company comes highly recommended from all of the people I know who depend on it.

Some sample prices: a bag containing 3 toggle switches \$2.25, 1/2" sq. x 2" magnets \$2.00, color sensitive photo cell \$5.00.

#### ANYONE WHO CAN WHISTLE

P.O. BOX 4407, KINGSTON, NY 12401

This catalog is like Crate and Barrels's answer to exotic musical instruments. A cassette that includes examples of the instruments featured in the catalog is available. All of the instruments featured in Anyone Can Whistle are beautiful sounding and easy to play. Some of the instruments include tongue drums, window harps, stardust (a wonderful metallic ball that produces unworldly chime sounds when tumbled), and wind chimes.

Some sample prices: 15 string Nordic lyre \$275.00, set of 5 bird calls \$89.00, Appalachian autoharp \$295.00.

#### INTERSTATE MUSIC SUPPLY

P.O. Box 315

13819 West National Ave.

New Berlin, WI 53151

This company came highly recommended by Bart Hopkin. Interstate Music Supply carries school band instruments, accessories, mic stands, microphones, electric guitar effects, etc....

Some sample prices: flutophone \$1.45, Amati low C bass clarinet \$2095.00, general timpani stick \$15.00.

#### ELEMENTAL DESIGN

P.O. Box 565, Union, ME 04862

Jim Doble is an instrument builder who hand crafts percussion instruments. Through Elemental Design, he offers bass tongue drums, slate xylophones, and copper wind chimes.

Some sample prices: all glass chromatic aquarion (22 keys) \$235.00, Pipe harp (copper pipes on nylon rope) \$47.00.

#### THE EARLY MUSIC SHOP

38 Manningham Rd. Bradford, West Yorkshire BD1 3EA, England

This company sells museum-quality harpsichords, cellos, timpanis, renaissance recorders, pedal harps, lutes, and instrument kits.

Some sample prices: Moeck tuju bass recorder L652.14, French double harpsichord (63 notes) half finished L5,665.68.

#### KELISCHEK WORKSHOP

Rt. 1 P.O. Box 26, Brasstown, NC 28902

These are the people who wanted to know what right I had to judge their company. I have been told by regular customers of this company that the instruments are good quality and the service is quite good.

Instruments include bagpipes, rebecs (medieval predecessors to the violin), gemshorns (cow horn wind instrument), and many other medieval and exotic instruments.

Some sample prices: Highland half size bagpipes \$215.00, bass keltorn (small crumhorn) \$845.00.

#### ANDY'S FRONT HALL

P.O. Box 307 Wormer Rd., Voorheesville, NY 12186

This company is well known for its great service and its quality instruments. Their catalog is packed with a great assortment of folk instruments (bodrans, banjos, harps...), instrument kits, books and recordings.

Some sample prices: alto bowed psaltry (32 strings) \$230.00, 22 stringed lap harp \$465.00, African talking drum \$90.00.

SILVER BUSH PRODUCTIONS  
P.O. Box 541, 25 Rosario Rd., Forest Knolls, CA 94933

These are the people who played a didgeridoo over the phone for me. They have a catalog of Australian Aboriginal art and instruments.

Some sample prices: Aboriginal clappsticks (pair) \$25.00, museum quality didgeridoos \$175.00 to \$500.00.

LARK IN THE MORNING  
P.O. Box 1176, Mendocino, CA 95460

Another very respectable source of exotic instruments including lutes, harps, button boxes and a variety of wind instruments.

Some sample prices: hurdy gurdy \$2095.00, 28" bodran \$160.00, Greek bouzouki \$400.00.

HUGHES DULCIMER CO.  
4419 W. Colfax Ave., Denver, CO 80204

A fine assortment of dulcimers, harps, hurdy gurdys, and instrument kits.

Some sample prices: hurdy gurdy kit \$180.00, completed hurdy gurdy \$384.00, completed mandolin \$106.00.

MUSICMAKER'S KITS, INC.  
423 South Mainm, Stillwater, MN 55082

This company has a good selection of stringed instruments, wind instruments, instrument kits, and accessories. Jerry Brown designs the instruments featured in this catalog.

Some sample prices: hurdy gurdy kit \$179.00, finished hurdy gurdy \$450.00, 31 stringed gothic harp \$1195.00, Greek lyre (10 strings) \$79.95.

IN THE TRADITION  
P.O. Box 223, Deer Isle, ME 04627

Debbie Suran, master instrument builder, custom makes instruments based on the design and woods that the customer selects. Dusty strings hammered dulcimers. Accessories, books, and recordings are also available.

Some sample prices: 23 stringed dulcimer \$455.00, Zen-on Chromatina 331 electronic tuner \$79.00.

LUTHIER'S MERCANTILE  
P.O. Box 774/412 Moore Lane, Healdsburg, CA 95448

This company sells instrument kits and accessories.

Some sample prices: Highlander acoustic guitar pick-up \$170.00, universal binding machine kit \$85.00, drill jig for classic tuners \$39.00.

ALI AKBAR COLLEGE OF MUSIC  
215 West End Ave., San Rafael, CA 94901

This company sells instruments, videos, books, and recordings from India. The instruments are built by the master instrument builders of India. Among the instruments are tablas, sitars, tanpuras, electric sruti boxes.

The catalog I received did not include a price list.

ENCINITAS IMPORTS  
955 Second St., P.O. Box 419, Encinitas, CA 92024

Another company that is dedicated largely to the music of India. Among the products available are flutes, tablas, sitars, harmoniums, tapes and incense.

Some sample prices: single gourd sitar \$350.00, harmoniums

\$390.00 to \$730.00.

ELDERLY INSTRUMENTS  
1100 N. Washington, P.O. Box 14210, Lansing, MI 48901

This company has a HUGE selection of acoustic instruments, electric instruments, instrument accessories, used instruments, and an amazing collection of recordings.

Some sample prices: Junior Martin cajun accordion \$1175.00, DigiTech RDS 4000 digital delay unit \$199.00, dobro \$600.00.

HOUSE OF MUSICAL TRADITIONS  
7040 Carroll Ave., Takoma Park, MD 20912

Another tried and true company, the House of Musical Traditions has a great collection of unusual instruments including tambouras, ocarinas, Tibetan bells, balafons, instrument kits, accessories.

Some sample prices: Chinese bamboo 6 hole flute \$13.00, Hardie Blackwood bagpipes \$650.00, Nigerian talking drum \$250.00.

FOLK MOTE MUSIC  
1034 Santa Barbara St., Santa Barbara, CA 93101

This company has a good sized collection of high quality harps and accessories, Irish flutes, bodrans, and instructional books.

Some sample prices: Lupine 36 string harp \$1570.00, Triplett Zephyr travel harp (22 strings) \$475.00, Korg D2-2 electric tuner \$65.00

STUDIO LUNA  
P.O. Box 252, Half Moon Bay, CA 94019

Master instrument builder/designer Catherine Favre builds everything available on this catalog. Her catalog includes rainsticks, moon harps, wind instruments, and rattles.

Some sample prices: Moon harp (11 strings) \$300.00, rattles \$12.50 to \$35.00, kelp horns \$25.00 to \$35.00.

AMERICAN DESIGN COMPONENTS  
P.O. Box 2601, Secaucus, NJ 07096-2601

This company sells materials a lot of which are very handy for instrument builders who prefer to work in the electronic medium. Their catalog includes computer equipment, batteries, transformers, motors, switches, etc...

Some sample prices: 14" CGA color monitor \$149.00, 3mm blinking LED \$.79, 60 RPM motor \$.95.

THE BOONE TRADING COMPANY  
562 Coyote Rd. Brinnon, WA 98320

This is another company that sells materials of interest to instrument builders. Because of the large array of animal hides, tusks, and teeth, some people may have objections to using these products. Bart Hopkin has ordered a few ostrich egg shells from these people and was pleased with the product as well as the price. In addition to animal hides, tusks, teeth and egg shells, this company sells jade carvings, beads, inks, and books.

Some sample prices: ostrich egg shell \$20.00, coyote skin (4' long) \$48.00, mother of pearl slabs 1/4" x 1 1/2" x 4" \$75.00.



## OF BOWHAMMERS AND PALMHARPS, CONUNDRUMS AND KABALIS:

Mike Masley's *Urboriginal Innovations*

by L. Maxwell Taylor

Instrumentalist and composer Michael Masley first came to renown as an innovator on the *cimbalom* or *cymbalom*, a large hammer dulcimer associated with Gypsy orchestras which is the national instrument of Hungary. First in his native Michigan, later in his adopted Berkeley, Masley (rhymes with "paisley") has played an ethereal music on the streets, hypnotizing circles of spectators with bell-like or bowed counterpoint over a sustained, resonating tonic. His earlier recorded works feature vaguely Celtic modalities rendered with his unique "bowhammers" and the techniques he has developed for using them (see below); his latter-day recordings, belonging more to the "world music" genre, incorporate far-flung experiments in rhythm, timbre and pitch and feature some of the experimental instruments described below. While the major-label backing he seeks continues to elude him, his original approach to the cymbalom has garnered a coveted entry in the eighth edition of *Baker's Biographical Dictionary of Music and Musicians* (1991).

Where traditional cymbalom players have used two mallets, Masley uses eight, custom-crafting one for each finger, first modifying it to accommodate strands of horsehair for bowing (see Figure 1). The resulting devices ("bowhammers"), supplemented by a thumbpick on each thumb, allow the player to strike, bow, or pluck the strings as the Muse occasions, and provide an exceptionally broad sonic palette for a solo instrument. The spectacle of "bowhammer" performance alone might be unusual enough to draw small crowds; in tandem with the music thus created, it's a *livelihood*, albeit one, quips Masley, "outside the lunatic mainstream."

Masley's search for new tonal colors has not been confined to the cymbalom. Amplification and digital signal processing have opened up an embarrassment of new timbres, many too subtle for street or stage but well suited for the studio. In search of ways to extend the voices of extant instruments, Masley has fashioned several wholly new ones, with their own distinct timbral vocabularies and "faux" ethnicities, all the more ironic in their exhibition of "good ol' American ingenuity." Some are

peculiar hybrids of urban and aboriginal, instruments imaginary tribal peoples might have concocted had bungee cords and turkey basters fallen from the sky. Others could only have been invented by an American hardware-store habitué with an affinity for elaborate puns and arcane discussions of "abstract carnivores,"<sup>1</sup> crop circles and chaos theory.

One such "urboriginal" instrument Masley has dubbed the *Palmharp* (Figure 4). It begins with an ordinary kitchen egg-slicer superimposed on a palm-sized shaker drum. Rubber bands of various tensions are strung parallel to the slicing strands, creating largely unpitched rubber strings. The slicing strands are reconceived as pitched metallic strings; pitch control is effected by bending the metal egg slicer, the whole operating idiomphonically, like a musical saw. While the saw may reproduce exact melodies, the lowly palmharp does not aspire to Bach partitas. Its gift is neither melodic nor harmonic but textural. If the saw sings, the palmharp speaks: the shaker whispers and hisses, the head skin snaps, the metallic and rubber strings (strummed, struck and strained all at once) render other grunty, snappy, tweepy, yipey timbres. The palmharp is fundamentally something to be squeezed and struck and shook, an idiosyncratic idiophone.

A more serviceable, *plausible* instrument Masley has innovated is the *Kabali*, "a sixteen-string modified dumbek." (Originally the *Kabouli*, Masley later changed the name because, as he abashedly admits, he discovered a noodle dish so named). An "off-the-shelf, stand-alone" dumbek (a Turkish bell-bottomed metal drum) is modified thus: a section of truncated PVC pipe, sitting atop a suction cup stuck to the head, is carefully



Figure 1. Mike Masley playing the Cymbalom with the bowhammers he developed out of materials such as metal cookie-cutters, vacuum-cleaner belts and horsehair. Photo: Debra Nash

1. As though his *Baker's* entry were only the beginning of an invasion by stealth of America's reference shelves, a soon-to-be published book of quotations includes Masley's bid for lexical immortality, a definition: "Time: An abstract carnivore; found at the top of the food chain." (*Timeless Thoughts/Collected Wisdom*, Mark Kastin, ed. (1993))



Figure 2. The *Kabali*, a "sixteen-string modified dumbek" generically referred to as a "bungee drum," and the *Conundrum*, a dumbek with a synthetic head supplemented by suction cups and a very long rubber band. Photo: Debra Nash

fashioned into a bridge, across which are strung multiple bungee cords (Figure 2). A kitchenware spring circles the drum below the head, allowing the bungees to be tuned, which produces a timbre resembling multiple cellos strummed with earmuffs. These bungee strings can either be plucked, whereupon they snap back percussively onto the drum head, or strummed circularly, creating the complex periodicity of an irregular ostinato. Masley's 1990 recording *Mystery Loves Company*, itself a hybrid of mostly low-tech instruments and high-tech recording techniques, features the *Kabali* on several of its world-music excursions.

The *Conundrum*, another dumbek-based rubberbandophone, utilizes a long rubber band wound around suction cups, these latter clinging to the drum's plastic head. The suction cups dampen the instrument's resonance, while string tension and suction-cup placement control pitch.

Many associate the panpipes with the soporific diatonicism of Zamfir, but Masley's *Water-Tuned Glass Panpipes*<sup>2</sup> introduce a random element into this ancient physical sequencer (Figure 3). Each pipe may be intentionally or arbitrarily tuned by adding water, creating a spectrum of modal, multiethnic and microtonal tunings. An ordinary turkey baster delivers water to each pipe, and makes a whimsically reckless disregard of "conventional" pitch relations not only feasible, but practical.

2. Masley's glass panpipes were built by Jim and Peggy Hall of Lacey, Washington, who likely did not contemplate their use with random water tunings.

Masley has endowed his hodgepodgeous *Sonic Mess Kit* with multiple textures and materials for creating and modulating pitch and timbre (Figure 4). In this device, the lip of a film-reel-can lid has been scored to admit two slightly splayed courses of rubber-band strings, one course more or less perpendicular to the other. Parallel to the lower course, three small-gauge springs are strung which, on closer examination, prove to be a single spring trebly segmented. The performer can control the tensions of the rubber bands and the spring segments: the strings or springs are individually adjustable, and the entire instrument's pitch can be modulated by bending the film-can lid.

Herein lies one dimension of this instrument's unique possibilities, an apparently random, yet strangely ordered, universe of pitch. Ordinarily, tuned strings in stringed instruments take us to stable tonal territory: a string, relative to another string, has its open pitch, a tonal landmark, a constant. Envision in your mind's eye and ear a guitarist simultaneously strumming open strings and straightening his instrument's wobbly neck, and you hear such intervallic stability even as global pitch varies. In contrast, the *Sonic Mess Kit*'s open-string intervallic relations are not *static* (like the wobbly necked guitar) but rather *dynamic*, and demonstrate the *SMK*'s own distinctive mollusc-like systemic integrity.

Figure 3. Left to right: turkey baster and *Water-Tuned Glass Panpipes* mounted on stand. The turkey baster is used to fill the glass panpipes with water, creating random tunings; below, the *Conundrum*, described elsewhere; behind the *Conundrum*, a pair of flexible metal rods used as a bow lean against their bow-ee, the *Pan-Timbre-Reen*, flanked here by a pair of palmharps; below these, another set of stand-mounted *Water-Tuned Glass Panpipes*; at right, the inventor and his *Kabali*. Photo: Debra Nash







Figure 4. The **Pan-Timbre-Reen**, the progenitor of Masley's **Sonic Mess Kit** series, evolved from a film-can lid, metal springs and some rubber bands, and can be struck, plucked or bowed. The product of hundreds of hours of experimentation and development, this instrument (photographed here with a pair of palmfronds) reveals its range and odd majesty best via an amplified, reverberant signal.

Photo: Debra Nash

To elaborate: On other, traditional instruments (such as dulcimers) multiple courses of strings would preserve static intervallic ratios. But because the *SMK* itself bends along 180 degrees of potential axes, and because its rubber-band courses are nonparallel, the pitch relation of one course to the other varies *dynamically*. Bend the instrument along an axis perpendicular to a course of strings, and the global pitch of that course deepens. Bend it perpendicular to neither axis, and both courses' pitches vary unequally, but with a mathematical exactitude. Bend it beyond a certain degree on any axis and the rubber-band courses touch, dampening both, at which point its spring-derived timbres predominate.

In the *Sonic Mess Kit*, as in the snowflake, the random and the exact meet and fuse. Its rubber-band strings are tunable, if only in a rough, imprecise way, and Masley's tunings also have a random character to them, as though no particular pitch matters to him, only that there be a multiplicity of pitch. Yet there is a great precision to the relationship of the *Sonic Mess Kit*'s random courses. They are somehow the aural equivalent of fun-house mirrors or comic page impressions on Silly Putty, preserving the contours of the images they reflect while radically altering the appearance of those images from moment to moment. The result: a pitch universe in which no stable center governs yet which, for all its randomness, demonstrates an elastic stability.

3. At this writing, the **Sonic Mess Kit** continues to evolve, becoming more of a "series" than an individual instrument. Not only film-can lids but now metal breakfast trays and butter-cookie cans writhe uncomfortably beneath the condenser mics. The progenitor of the series, having now become so complex as to resemble the inside of an analog watch, bears a new name: the **Pan-Timbre-Reen**.

#### ABBREVIATED DISCOGRAPHY

1. **Watersigns** (1983) (unreleased).
2. **Cymbalom Solos** (1985). Uncluttered bowhammer cymbalom pieces, recorded in one afternoon. Always in print.
3. **Mythos** (with guitarist Barry Cleveland, flautist Kat Epple and synthesist (the late) Bob Stohl; this recording was Cleveland's project.) (1986) (Vinyl/out of print.)
4. **The Moment's River** (1987). Cymbalom, flutes, synthesizers and sampled percussion in a more elaborately produced setting.
5. **First Frost** (with Barry Cleveland) (1987). Cleveland and Masley also performed together live under the name Thin Ice. (Cassette/out of print.)
6. **Bells & Shadows** (1989). A return to the simplicity of *Cymbalom Solos*, but with several years' recording experience.
7. **Voluntary Dreaming** (1990). Barry Cleveland's exotic Scarlett Records CD features Masley's trademark bowhammer cymbalom playing amid a sumptuous tapestry of detailed guitar textures and polyrhythmic percussion. Now out of print but sharp-eyed collectors may still find it in record stores.
8. **Mystery Loves Company** (1990). Features the Kabali and water-tuned panpipes; also features Zakir Hussain on tabla. Rich, dense, experimental.
9. **Sky Blues** (1992). Excursions on cymbalom, autoharp; unique percussive cymbalom pieces with "tribal" hand-drum accompaniment.
10. **Cosmosis** (with cellist Dan Reiter) (1992). Astonishingly broad receiving antennae for improvisational inspiration: cymbalom, cello, and a variety of flutes and panpipes.
11. **Life in the Vast Lane** (1993). Primarily solo cymbalom, with a short sonic coffee break on Pan-Timbre-Reen and panpipes, this work alternates between catchy arrangements in a modal vein and conscious attempts to set aside familiar harmonic language.

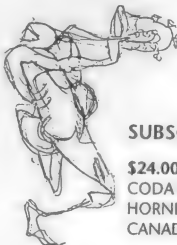
Titles 2, 4, 6, 8, 9, 10 and 11 are available by sending \$12.00 per cassette (includes return postage) to Michael Masley, TONEHEDGE PRODUCTIONS, P.O. Box 5232, Berkeley, CA 94705. For further information, call (510) 548-1241.

*L. Maxwell Taylor, himself a composer and instrumentalist, will be releasing a collection of his own recent work, The Cheshire Tree, sometime during 1993. He can be contacted by writing to MYSHKAZIPPY PRODUCTIONS, 219 John St. #1, Oakland, CA 94611, or calling (510) 653-1673.*



## CODA MAGAZINE

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## THE SOUND HUNTER

By Roman Pawlowski

Translated from Polish to Dutch by Jacek Kawalec  
Translated from Dutch to English by Danny O'Really

This article first appeared in the Polish newspaper *Kurier Poranny* in 1991.

Have you ever seen a green colored Mercedes bus converted into a "House on Wheels" with a red dog lying behind the windscreen peering outside? The owner of this extraordinary vehicle is none less than the sound-hunter Martien Groeneveld from Amsterdam.

The wooden interior of the bus produces a sound which closely resembles the squeaking of an old Spanish galleon. So even when driving he is surrounded by sound.

Besides his dog Luna, a complete collection of magical instruments accompany him on his travels throughout Europe. For example, an electric basket, an enormous xylophone, a sea-machine, a roof-tileophone and numerous other small self-made instruments.



Martien Groeneveld with several of his instruments: the Giant Xylophone, Sea Machine and Roof-tile-o-phone.

## THE SEA

Groeneveld's roots lie in a small village near the sea in the vicinity of Rotterdam where he grew up. During his youth he never failed to attend the launching of a new ship. All inhabitants of the village gathered round the hull to christen the newly born ship. The sound of the breaking champagne bottle, the hammering of the big wooden wedges which support the construction, the splashing of water, the excited crowd, the ship's horns, all made a deep impression on Martien. It's very likely that these experiences gave him the idea for visual music: theater for sound and vision! There is no doubt how he became inspired to build a machine which imitates the sound of waves at sea. This machine is only one of the many he uses to perform his spectacular plays throughout Europe.

## THE CITY

Another big influence in Groeneveld's music centers around urban life. Amsterdam! Noise tower of Babel. A melting pot for languages and cultures from all over the world. This is the main hunting ground for Martien's sounds.

He found his "Tileophone" here: a number of ceramic roof-tiles, hung on a wooden frame, originally coming from a 19th century building in the city center.

Also the "Electric Washing Basket" which involves a number

of washing lines attached to a wicker work basket and stretched across the stage during performance. In a magical way this basket produces the sounds of dripping water and careening trams.

When Groeneveld first started to perform at the end of the seventies he used a similar set up, that required members of the audience to turn a number of handles and so operate a bank of tape recorders making the theater sound like a tram depot!

## THE STREET

For Martien the urban jungle is the ultimate natural theater of sound. He talks enthusiastically about an extraordinary three-day concert that he witnessed when the street in front of his house was broken up and repaved. In the mornings the still-fresh workmen would go about their activities tapping the stones, with a steady rhythm. Later on in the day the rhythm would slow down and start an irregular syncopation. No, Martien's collection of musical instruments doesn't include percussive paving stones anymore. However, listen to his xylophone playing and you just might recognize the rhythm of the roadworkers in the Bakkerstraat, central Amsterdam.

## PARODYING CONVENTIONAL INSTRUMENTS

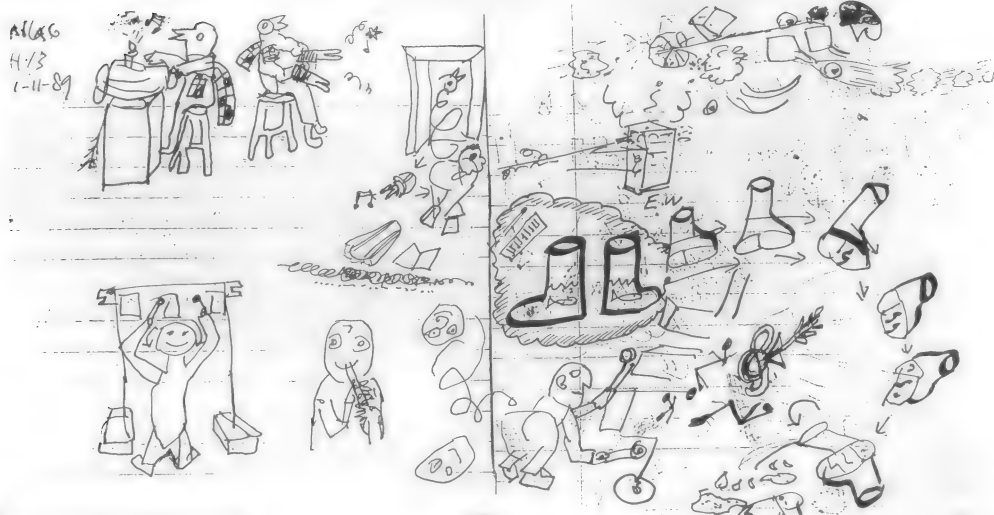
Many of Groeneveld's ideas about music are based on experimenting with conventional instruments.

During the "Festival of Unpopular Music" in England Martien played "the biggest harmonica in the world". This consisted of a car bumper functioning as the sound board for 15 ordinary mouth harmonicas. Equally avolacious\* was the artist's treatment of a grand piano, standing on it and playing it with rubber tipped bamboo sticks.

One of these concerts started in the destruction of a piano made of packing foam that was fastened on the side of the real instrument. Recently Groeneveld added a new instrument to his collection: with a sawn off Volkswagen Beetle chassis strung like a harp he parodies the conventional instrument. It somehow

\*Avolacious: This wonderfully obscure word, which entered the article in the course of translation first from Polish into Dutch and from there into English, is not to be found in contemporary English dictionaries. However, the *Oxford English Dictionary*, with its extensive historic annotation, contains *Avolation*, marked as "verbs" (= obsolete), and defined as "the action of flying away; escape; exhalation; evaporation."

Pages from  
Martien  
Groeneveld's  
notebooks



PHOTOS THIS PAGE:

Right: The Giant Xylophone  
(Photo © Zbigniew Paluch, Warsaw).

Below: Martien Groeneveld with Volkswagen-Beetle-Harp  
(Photo by A.M. Norman, Amsterdam).

sounds like an Indian sitar.

Within his seemingly insane expression of his aversion to the conventional use of instruments there lies a philosophy: "More important than any perceived rules of sound or the preconception of an audience, is the personal creative language expressed by the artist".

## LIVING ON THE THRESHOLD

Groeneveld started as a painter. In 1974 he graduated from Amsterdam Art College. Escaping from the claustrophobia of his workshop was the real beginning of his artistic life; he needs contact with his audience without the intervention of a gallery or art foundation. Leaving his workshop behind also involved leaving his house. For almost a year he lived in his Mercedes van, the interior of which resembles a ship's cabin.

The artist is at home anywhere. The realization of this idea was one of Martien's most original happenings, which took place in 1979 in the "Vrije Universiteit van Amsterdam" (one of Amsterdam's two universities, where Martien was a student). For an hour Martien lived in one of the revolving doors in the main entrance to the university. Between the windows on a wooden platform stood a little table



behind which Martien was sitting on a chair. On the table were a few books, a camping stove and a potted plant. A pair of wooden skates were hanging from a hook attached to the window. Only curtains were missing!

Many people entering the building didn't notice the unusual dwelling. With some difficulty they would overcome the resistance of the revolving doors causing Groeneveld to circle round and round. Some who acknowledged the presence of a human being within the doors assumed it to be a protest against the appalling conditions of student accommodation at the time. Others stopped to converse with him about Art, Civilization and Life.

This performance, held ostensibly for the latter group, was ended by the intervention of the porter.

*Martien Groeneveld can be reached at Mauritskade 23, 1091 GC Amsterdam, Holland; telephone 3120 665-9954.*





SOUND THEATER

CIRCUIT-BENDING  
AND  
LIVING INSTRUMENTS

# VOX INSECTA

BY DUBAIS REED GHARALA

Four antennae waved high into the summer sky. Two of these belonged to a cricket perched far above the ground atop one of the other pair of antennae, this one a towering metal grid, itself searching for clues in the same atmosphere. Down below, in the crouched building from which the greater pair of antennae grew, Dr. George W. Pierce watched the glow of instrument dials and listened to high-frequency translations. Both creatures strained at the edge of perception as the evening clouds thinned and slipped away.

In a voice as ancient and familiar as the stars, the cricket sang out, listening for a reply in the darkening air. Though Pierce was unaware of this particular insect, his mind was preoccupied with questions about its call. What messages are hidden within such song? How are these sounds created? And how can they best be recorded across their entire frequency range (15 Hz to 80 kHz) for analysis?

Dr. Pierce served as the Director of Cricket Laboratory on the campus of Harvard University from 1914 to 1940. The anthropoid appearance that the towering antennae gave the building was truly fitting since it was inside that structure that Pierce, an entomologist himself, built a ground-breaking series of elaborate devices for the study of insect sound...

## VOX INSECTA

(continued from previous page)

Pierce's writings, along with the technical journals of researchers such as Peter Thomas Haskell and Arthur W. Ewing, not to mention the captivating prose of entomologist Vincent G. Dethier, have fairly well described the nature of insect sound ... but still I wonder, where is the insect voice synthesizer?

Examples of dedicated insect synthesizers do exist. I've heard that certain jungle tribesmen attract birds by mimicking with blown grass and leaves the sounds of food-source insects. The bull-roarer, ancient in its history as more a ritual object than a synthesizer, is now spun as a toy over the heads of children in the orient, buzzing as it twirls, shaped like a grasshopper with rubber-bands attached to add to the noise. Once while browsing the flea market at Porte de Clignancourt in Paris, I was startled by the distant squawking of what sounded like an unusually boisterous chicken. As I approached the source of the sound, there stood a vendor with a friction toy, a small cardboard cup with a string emerging from the opening, tied through the center of the bottom. Stroking the string correctly with a rosin-covered card (an art in itself I was soon to discover after purchase) brought forth these realistic sounds. I'm told there are examples of this plaything that replicate the voices of insects as well. Additionally, I suppose we've all seen the little metal clickers known optimistically as "crickets", predecessors of the modern versions that respond to the same finger pinch. These small insect and reptile trinkets are beginning to appear in the form of keychains and as pocket toys that electronically simulate natural calls while diode eyes flash and nearby cats snap to attention. But the only available apparatus I'm aware of to synthesize true insect noise is in the form of, wouldn't you know it, an insect repellent. The miniature device is worn on the person and emits the sound of a dragonfly in flight, apparently terrifying to mosquitos.

The emotional value of environmental sound is of particular interest to me. I often find myself hearing sound as an abstract mosaic, unrelated to its sources. Though the consequences of this are occasionally startling (I'm not alone, right?), to me the larger effect is one of sonic surrealism. To implement these directions in composition the question of creating and augmenting "natural" sounds will arise. Sampling offers many wonderful solutions to this problem, but alternately, synthesis by means of simple oscillator circuitry can produce equally effective results in many areas, especially insect songs. And it's much more expensive and complicated to build a sampler and collect insect voices than it is to construct the alternative.

The classification of insect sounds has been narrowed down over the years to include five major categories. These are: 1) Air expulsion, as in the famous hissing cockroach



Above: VOX INSECTA SYSTEM consisting of the voice synthesizer and digital reverb/amplifier chamber.

Left: A closer shot of the synthesizer.



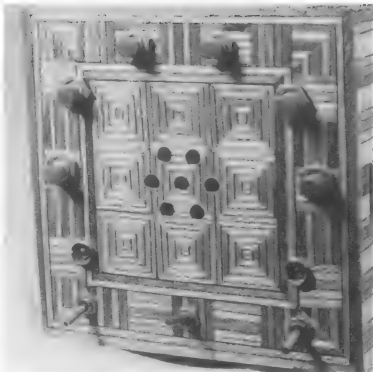
(*Gromphadorhina*) and Death's Head Hawk Moth (*Acheronti atrops*) as well as the lesser-known audible behavior of the tsetse fly whose pneumatic language is surprisingly elaborate, 2) Percussion, as in the Australian 'whistling moth' (*Hecatesia*) whose enlarged forewing sound ribs, called castanets, strike together on the up-stroke, 3) Click mechanisms, such as the much heard tymbal organs of the cicada (*Cystosoma*), 4) Vibration of wing, body, or appendage, as in the buzzing of mosquitos or the delicate signals passed through the substrate such as those produced by

chloropid flies (*Lipara*) as they communicate by means of plant tissue, and 5) Stridulation, the friction of one object against another as in the songs of crickets and grasshoppers. With categories remarkably similar to the wind, percussion, and string sections of the orchestra, the class insecta is in possession of a collective vocabulary as diverse, perhaps, as that of any phylum on the planet.

The Vox Insecta instrument system (see photo) was built in an attempt to generally replicate audible insect sounds within all five categories above. In addition to this, the system is designed to further abstract these sounds, for the sake of sonic impression, into unidentifiable but still life-like calls. When pushed to the limit, with controls set to their extremes, the Vox Insecta system also produces



Right: Simple "Bug Box" built by the author in the early 80s.



"electronic music" straight out of the classic science fiction movies of the fifties, with series of notes and noises popping-up in rhythmic cycles, rich in sweeping overtones. The soundtrack work of Louis and Bebe Barron from the quintessential *Forbidden Planet* comes quickly to mind. Those familiar with the movie may recall that in addition to the score being punctuated with these sounds, the futuristic music of the "Krell", a lost master race, is also represented in several scenes. A little quirky by today's standards, for the 50s it was just right.

Building a simple insect sound synthesizer costs less than ten dollars and takes only a little effort. This basic circuit was at one time described in literature available at Radio Shack outlets pertaining to the LM 3909 LED Flasher chip, which also serves very well as an audio oscillator. If you find that their current "Engineer's Notebook" series no longer covers this device depicted in a tone-burst or chirper diagram, you may send me a SASE for similar information.

The Vox Insecta expands upon this circuit, adding a third LM 3909, variable resistors, and several timing capacitor banks in addition to a photo-diode for shadow modulation and eight circuit-bending\* paths used singly or in combination. Designed to take advantage of both the mechanism and the insect-like shape of a discarded Stenograph machine, twenty-two mini-switches were fabricated from brass rod stock and, when placed side-by-side behind the row of print-blocks, each of these can be activated by pressing the appropriate Stenograph key. This allows simultaneous control over timing and mix of all three oscillators, as well as bending paths discovered, as usual, after completion of the basic working electronics. Visually inspired by the "dog day" cicada (*Tibicen canicularis*), the case is finished in two shades of deep metallic green with iridescent flecks throughout, the keys are several coded shades of veined fluorescent lime to simulate wings, and sunken into the top of the body are two clear antique glass marbles, each with a fluctuating bright orange status LED shining within, glowing like the insect's large principal eyes.

While the active Vox Insecta instrument contains a small monitor speaker, prior experience with the reflective nature of acoustic horns encouraged me to incorporate one into the system. This passive amplifier/reverb chamber (see photo) seems to give a more natural depth to the insect voices. The old wooden radio horn, vintage late 20s, was bought at auction for only a few dollars since its entire base and transducer were missing. (Complete units tend these days to cost \$50-\$100). The horn was installed in the bottom of a large inverted wooden bowl, now fitted with a modern amp and digital delay. Four brass-knobbed drawers connected to slide potentiometers emerge from the front of the housing. These adjust

the digital effects, while on the back, mike and line-inputs as well as volume and tone controls are located. Headphone, line, and speaker outputs are also built in.

Insects songs tend to add a sparkling pointillist rendering to sound-fields. Contrary to the greater efforts of contemporary synthesis techniques, their being centered more often than not upon massive layering and dense tonal structures, the Vox Insecta system looks to the opposite end of this spectrum preferring to explore the small and delicate voices in our midst providing colors for composition that, it seems to me, are as vital as any that exist.

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**Insect Sounds** by P. T. Haskel. Quandangle Books, Chicago

**The Songs of Insects** by George W. Pierce Ph.D. Harvard University Press, Cambridge, Mass.

**Crickets and Katydid, Concerts and Songs** by Vincent G. Dethier. Harvard University Press, Cambridge, Mass.

The author will accept assignments to construct any of his devices covered in EMI, circuit-bent or original, although availability of specific electronics for bending is often uncertain. Contact Q. R. Ghazala at Sound Theater, ECHO 241, 7672 Montgomery Rd., Cincinnati, Ohio 45236

Computer assistance by Tony Graff, painter and fine artist.

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\*Circuit-Bending refers to the process of creative short-circuiting by which standard audio electronics are radically modified to produce unique experimental instruments. A further description of these techniques can be read in EMI Volume VIII#1, Sept. 1992.

## SYSTEMS FOR NON-LINEAR INSTRUMENTS AND NOTATION

## Part Two

By Dan Senn

*This is the second half of a two-part article. The first half of "Systems for Non-Linear Instruments & Notation" appeared in EMT's June 1993 issue.*

## APPLYING A NARRATIVE SCORE TO A NON-LINEAR INSTRUMENT

In 1989 I was commissioned by an American group, The Performers' Workshop Ensemble, to build a Scrapercussion soundscape and an accompanying piece for their upcoming European tour. The group consisted of a mix of musicians, mimes, and actors, none of which were trained percussionists. A majority of their tour would be in West Germany during the time when the East German government was coming apart. Because my Scrapercussion soundscapes are non-linear instruments, and the fact that the group lacked trained percussionists, I approached the composition from a wholly non-linear perspective from the outset.

Before collecting scrap for the Scrapercussion #8, I decided to limit myself to garage and rummage sales in the south east part of Muncie Indiana — the working class section of the city.

After collecting and classifying the articles according to sound, shape and social function (an organizational path I have used in making all scrapercussions), I assembled the instrument while keeping in mind that since this would be the first Scrapercussion to travel without me, a language must be carefully developed to describe it in every detail. These descriptions, along with the soundscape itself, would be as much a part of the composition as the notated score itself. As given on page two of the score, the instrument — which is as much the score as the written score itself — is described in detail along with instructions for assembly. By logistical necessity, the "action area" of the score was not begun until the instrument was completed.

At this point, it is important to note that the decision to construct a non-linear score was based on the non-transparent character of the instrument. Scrapercussion instruments are always organized along a physical continuum meaning that all the scrap objects are interconnected in a continuous thread via 1/4 and 3/16 inch rod. To strike any part of the soundscape is to strike the entire instrument (Senn 1983). This provides an endless continuum of timbres and to properly map out discreet sounds onto a horizontal time line is obstructive — a veritable

## Loose Change by Dan Senn (BMI)

**Loose Change, for Four Changing Scrapercussionists and Changing Conductor, is written for five performers who alternate in three character roles: Scrapercussion Player, Leader of the Scrapercussion players, and Conductor. The piece is in seven sections, Section Zero through Section Six, with the performers changing roles sequentially. You will note in the Performance Table on page three that Player E begins as the first Conductor in Section One and then replaces Player A in Section Two. After two sections as a Player alone, Player E becomes the Leader in Section Six. This sequence of role changes, with varying starting points and Scrapercussion limb positions, is the same for all performers.**

Simple Relationships between the Conductor, the Leader and the Players must first be understood. As the Conductor performs the prescribed activities given in the Change Table, she or he seems to conduct the Players unintentionally. The Scrapercussion Leader acts as both the "eyes" for the group and the initial interpreter of the associated percussive textures. Here is an example. When the Conductor goes to the chair to "Pick up the newspaper," at change #3, the gesture acts as cue for the Leader to initiate the sound texture at the same level in the Change Table. As the new texture is performed by the Leader, the remaining three Players, with instructions to initiate the player to their right, eventually follow suit.

This Unintentional Conducting is an essential part of the conductor's character. Because the Conductor(s), the Leader(s), and the Players are restrained only by the given instructions, (and, of course, the performance practice of our time), these cases must remain *unform* between the Conductors. Beyond this, each Conductor will interpret the instructions individually and, therefore, adjust timings to their own tastes.

Discrete Levels of Perception between characters must be carefully maintained throughout and are given below.

The Conductor is aware of the Players and occasionally of the audience when, for example, she or he is directed to break character at change #4 in the Change Table. As each section evolves, the Conductor identifies and replaces the Leader but at first, the Leader and the Players are perceived as one. The Leader is only aware of the Conductor. The Players are only aware of the Scrapercussion Player to their right.

The performers, while in these roles, are oblivious to all other action with two exceptions: 1) Players A through D enter the performance space unaware of each other or the audience, and, 2) at the conclusion of Section Five, all performers are aware of each other and the spilled change as they "scramble madly, greedily for the loot." These levels of consciousness may or may not be clear to the audience, but they are essential to the performance.

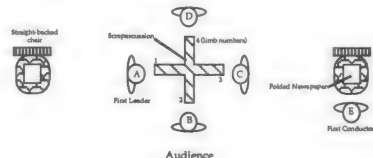
Loose Change is written for Scrapercussion #8 but may be played on other Scrapercussions with a few modifications, i.e. a substitute for the shutter rods in the Change Table may need to be made.



Dan Senn with Scrapercussion #8.

## Performance Layout

Loose Change may be performed with one or more chairs each containing a folded newspaper.



Introductory page to "Loose Change" by Dan Senn.

"Loose Change" by Dan Senn (BMI) is available from New-sense Inter-medium, 1933 Commerce #301, Tacoma, WA 98402.

# Performance Table

Performance Table from "Loose Change" by Dan Senn.

| Player | Section Zero  | Section One  | Section Two   | Section Three   | Section Four  | Section Five  | Section Six  |
|--------|---|--|---|---|---|---|--|
| A      | As though alone, nonchalantly enter the performance area from off-stage with your hands placed comfortably in your front pockets which are filled with coins. You do not recognize the audience at this point, but may step out into the seating area. After a period of time, take notice of the soundscape. As you move cautiously toward the scrap-scrap, pull your hands from your pockets inadvertently spilling (without notice) the coins as you move. Position yourself behind your Section One limb and take a seat. | You are the Leader. Watching the Conductor carefully for initial change cues, perform the textures given in the Change Table beginning with #1 on Limb #1. | You are the Conductor. Follow the instructions given in the Change Table beginning with #1.   | You have replaced Player B. Imitate closely the sound textures performed by the Scapercussionist to your right, ignore all else.                | Continue as in Section Three.   | Continue as in Section Four.  |  |
| B      |   | Playing on limb #2, imitate closely the sound textures performed by the Scapercussionist to your right. Ignore all else.                                   | You are the Leader. Watching the Conductor carefully for initial change cues, perform the textures given in the Change Table beginning with #1. | You are the Conductor. Follow the instructions given in the Change Table beginning with #1.   | You have replaced Player C. Imitate closely the sound textures performed by the Scapercussionist to your right, ignore all else.                | Continue as in Section Four.  |  |
| C      |   | Playing on limb #3, imitate closely the sound textures performed by the Scapercussionist to your right. Ignore all else.                                   | Continue as in Section One.   | You are the Leader. Watching the Conductor carefully for initial change cues, perform the textures given in the Change Table beginning with #1. | You are the Conductor. Follow the instructions given in the Change Table beginning with #1.   | You have replaced Player D. Imitate closely the sound textures performed by the Scapercussionist to your right. Ignore all else.                |  |
| D      |   | Playing on limb #4, imitate closely the sound textures performed by the Scapercussionist to your right. Ignore all else.                                   | Continue as in Section One.   | Continue as in Section Two.   | You are the Leader. Watching the Conductor carefully for initial change cues, perform the textures given in the Change Table beginning with #1. | You are the Conductor. Follow the instructions given in the Change Table beginning with #1.   | As the Conductor spills the coins to acknowledge Section Five, all five performers scramble madly, greedily for the loot. Something like an Easter egg hunt. Small disputes might arise. When all coins are collected and pocketed, move to the front of the proscenium to acknowledge the audience and bow. |
| E      | Remain off-stage.   | You are the first conductor. Follow the Conductor instructions given in the Change Table.  | You have replaced Player A. Imitate closely the sound textures performed by the Scapercussionist to your right. Ignore all else.                | Continue as in Section Two.   | Continue as in Section Three.   | You are the Leader. Watching the Conductor carefully for initial change cues, perform the textures given in the Change Table beginning with #1. |  |

## Change Table

Change Table from "Loose Change" by Dann Senn.

| change sequence | Conductor  | Leader   | change sequence | Conductor  | Leader   |
|-----------------|--|--|-----------------|--|--|
| 1               | 1. If three performers remain from off-stage: Take note of the scene played on the down and "off" side of the stage. From your front two pockets, inspect a few coins. These coins are included here in the script of this play. Take note of the lead newspaper on the chair. | Choose an unusual pair of metals from your shirt to press pocket and begin to lightly, unevenly tap the outer edges of the script to your limb.  | 11              | Change position on the chair to <u>allow yourself to be</u> ... covered the crow's foot and holding to the other edge. Conductor to start the performer.   | Continue as in #1 with the metal of a lower metal volume rings and at a slight to medium distance while naming the other metal and of down a narrow stroke line.   |
| 2               | 2. <u>Take the newspaper</u> - inspect it while unfolding. Pay attention to identify reading the newspaper, possibly reach back with one hand leading for the chair.   | Continue as above but concentrate on the area close to and on the approach. At a light to medium volume, occasionally vibrate the outer edge of a piece of script.   | 12              | <u>Alphabetically name the limb and set up</u> ... Shortly place the lead newspaper under the arm and chest. Continue looking at the performer.  |  |
| 3               | 3. <u>Be upright in the chair</u> while continuing to read the newspaper without unfolding the paper. After a period of time, lean back to comfort and ease your legs. Continue reading the front and back pages of the paper.   | Continue as above lifting on or near the cap nuts with one metal while with the other softly, evenly tapping the metal which nearest the piece of script in the script. Do not every 11th or so his softly vibrate the script. Do not. | 13              | <u>Begin clapping</u> the scapercussionist from a "wide" distance while watching them carefully.   | Continue the above distance with one metal while playing a similar texture often pieces of script (leads scripting, i.e., the results of a hand).  |
| 4               | 4. <u>Turn the first page of the newspaper</u> and continue reading. While looking for an interesting headline as an anecdotal passage, you may turn a page or two.  | Hit the script point sharply in a even, regular beat of, say, 6 beats per minute. Occasionally vary a beat or two.   | 14              | <u>Take note of the newspaper</u> under your arm, <u>take hold of it with one hand</u> and move directly purposefully back to the chair from where it came. Just before setting the newspaper on the chair (arches above the chair), look at the audience as before and give.  | Continue playing the above texture using both metals within pieces of script while gradually slowing the rate.   |
| 5               | 5. When you have found a headline or word of interest, <u>lower the newspaper</u> and read it without acknowledging the audience. Make the newspaper and continue reading.   | Be a moderately dense texture, at a soft to medium-low volume ring. Hit the chair as softly while moving up and down your limb without up or down limb.  | 15              | <u>Place the newspaper on the chair</u> and read script. Separate your shoulders to the audience and place your hands in your front pockets. Your hands will remain here until Change 20. <u>Begin clapping</u> with strong notes of the script in your pockets. Remove a hair to the right.   | Begin counting and on every nine number state separate piece of script simultaneously with both metals at widely varying volume. Make as many varied combinations as possible.                                 |
| 6               | 6. <u>Shift your position in the chair</u> (crosses and cross your legs) continuing to read a page (or pages) while searching for a word.  | Continue as above with one metal while applying the same texture to the chair with the other. Do not after, begin to gradually decrease the density of the texture applied to the chair while it increases the volume.                 | 16              | <u>Turn your head toward the scapercussionist</u> while watching the performer. Put your hands in your front two pockets.  | Continue the counting sequence and texture from above while gradually lowering the volume. Eventually look the middle off the instrument while counting softly and making gestures at striking the instrument. |
| 7               | 7. Lower the newspaper further. <u>See your head</u> constantly toward the scapercussionist and face.  | Reflexly bounce head and forth between the chair and face in a even direction while watching the performer. Bounce again. Vary the volume between very soft (pp) and loud (ff).  | 17              | <u>Turn toward the scapercussionist and begin clapping</u> them in a even direction while watching the performer. Bounce again, suddenly empty your head at a performer other than the Leader. The player will not react. They may repeat this to another non-Leader scapercussionist.   | While continuing to count (unusually) lower (counting under the hands and arms in a "ready to start" position).  |
| 8               | 8. <u>Turn your head toward the audience</u> and make eye contact looking character. Look directly at an audience member and smile (laugh). Conductor's texture becoming older and look similarly alone. The newspaper is still being held "in hand" as if of use.             | Continue as above with one metal while performing a similar texture between the two used to connect the piece of script to the script point.   | 18              | <u>Remember all as a portion of the headline or complete</u> (possibly) on the phrase "all of the above" and the first. These will immediately distract the leader who will see the scapercussionist position in a read, accept the lead, sit in the nearest seat and begin empty the nearest limb of the scapercussionist with their finger tip. (see NOTE 10)      | Raise your arms and begin to emphasize on your limbs.  |
| 9               | 9. <u>Shower your limb</u> at script, smooth out the vehicle in the newspaper and casually fold it back into the chair it was found in. Place it under your limb.  | Fold the above texture to a face.  | 19              | <u>Move in position directly behind the leader</u> who will be watching to beeping it visual contact with the script. Tap with the leader's lead to keep eye contact with you. Speaking softly to the leader, repeat all or a portion of the headline or sentence. Begin to take interest in the leader's scapercussionist performance.                              | Continue the scapercussionist from above but include the script form adjacent limbs.   |
| 10              | 10. Turn your head toward the scapercussionist. <u>Begin clapping</u> the script. Then as above on the leg and then your arm on your hand starting at the performer.   | Stop the lowest piece of script on your limb in a dense regular rhythm with each event creating at a different volume and in different position.   | 20              | In an effort to play the scapercussionist, pull both hands from your front and <u>grasp all of the script in the first</u> . These will immediately distract the leader who will see the scapercussionist position in a read, accept the lead, sit in the nearest seat and begin empty the nearest limb of the scapercussionist with their finger tip. (see NOTE 10) | You have become the Conductor. Go to the first change on the Table and follow the instructions.  |

\* A refers to Section Zero Conductor only. \*\* Initial change cues from the conductor to the Leader are emboldened and underlined.

absurdity. Therefore, I decided to develop a notation where cells of activities were described in narrative form as given in page four of the score. The piece, called "Loose Change" would consist of twenty of these cells which would be repeated in canonic variation five times. Each new cell would be initiated by an "Unintentional Conductor" whose every movement around the soundscape is watched by a group leader who closely abides by the textures described in the score. The other players are instructed to imitate only the player immediately to their right. Textural variation occurs in performance as the information travels and decays from one performer to another 'round the instrument. The roles of conductor, leader, and players cycles once through all performers creating the canonic form demonstrated in page three of the score. Careful attention was given to what was referred to as "Discrete Levels of Perception" within each prescribed role. Since human beings are expert at detecting "who is paying attention to whom," it is a trait that may be regulated as given in the Introduction to the score.

## USING LINEAR INSTRUMENTS IN A NON-LINEAR CONTEXT

The above piece could be modified to be played on traditional instruments quite easily. For example, the wings of the Scrapercussion could be replaced by four percussion instruments or four groups of percussion instruments. As mentioned, an aspect of "Loose Change" is its use of the canon form, one of the easiest forms to comprehend in art. Each texture of the composition is initiated by a specific mundane gesture which is repeated over and over. The idea here is to draw the audience into comprehending the structure of the piece as quickly as possible and therefore enabling critical involvement at other levels of the piece.

## THE "INSTRUMENT" IS THE SCORE

Non-linear instruments are what they are. They do not lend themselves to serving a metaphoric cause. If metaphor arises out of their performance, it arises "randomly" with individual meaning and individual meaningfulness. Non-linear instruments mean what they are and they resist like cats the imposition of the artist's will on their performance. There is no need for a program or an abstract external score to direct the meaning. The instrument is the score — a fixed improvisational framework or geography out of which a universe of sounds and meanings may arise. Indeed, the "instrument" is not an instrument in that it does not willingly serve as an instrument for conveying meaning. At best, it is a participant, and this is the crux of the obstructiveness of musical scores as applied to non-linear instruments.

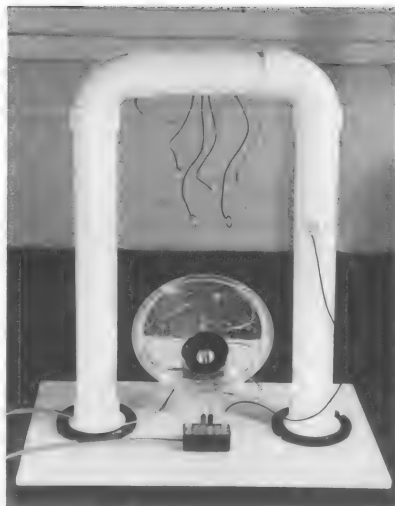
## FOUR HARPOONS

I will now present four recent instruments which were developed as sculptural instruments and intended for exhibition and performance within a single installation. Each instrument, while unique and sufficiently varied to stand apart from the others, was designed according to certain unifying principles, for example, using many of the same construction materials. Given below is a list of some these:

- found metal objects (used as resonators)
- nylon line threaded continuously through the instrument (used for structural support and as a sound source)
- the weight of found objects (determines the physical height of the

SHMOOS  
HARP by  
Dan Senn.

Photo by  
D. Senn,  
(1991).



resonant objects, as well as the pitch(es) of the nylon lines)

- threaded piezo transducers (contact microphones)
- plastic PVC pipe (used for the instrument frames)
- 3/16 inch threaded rods (used to connect resonant articles, as well as a transport for whirling disks)
- planned instability (interference with performer control)

## Shmoos Harp(oon)

The Shmoos Harp was the first instrument developed in this class and features a silver serving platter (purchased for \$2 at a local garage sale) suspended from six eyeloops screwed into a supporting PVC chassis. Two speaker transducers (magnets without diaphragms), off-set by metal spacers of different lengths, act as counterweights on either side of the platter. Six piezo transducers are pierced and threaded by a single strand of eight pound nylon line threaded through six small holes drilled in the platter. A small passive mixer (8 by 2) is mounted on the top support of the chassis which accepts the six piezo microphone inputs as well as two from piezos mounted on the chassis itself. Additional active electronics include a small integrated amplifier used to drive the speaker transducers, and a stereo limiter to compress the audio output. The instrument is amplified by a 100 watt or more p.a. system for live performances.

The instrument may be performed in two fundamental ways — as an amplified acoustic instrument, and as a feedback instrument. While it is tuned for responsive resonant frequencies just prior to a performance, scalar pitches are avoided.

As a pitch producing acoustic instrument, the Shmoos Harp (when not in motion) can produce 12 discrete tones, one on either side of the threaded and moveable piezos (these slide up and down the nylon lines). The strings may be plucked, struck, bowed or scraped (long thin pine dowels are used), or stretched to produce glissandi. The chassis and the platter may also be used as an acoustic sound source.

As a feedback instrument, the Shmoos Harp produces sounds which are quite unusual and beautiful. The simple



FAYFER HARP by Dan Senn Photo by D. Senn, (1981).

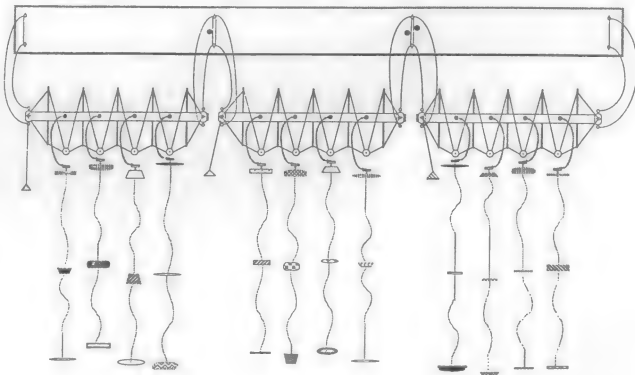
electronic circuit, which was first explored in the Scrapercussion instruments, cycles resonant frequencies between the two speaker transducers and the eight piezos by way of the stereo amplifier (piezos are alternately mixed to either channel). Therefore, the instrument's non-percussive sounds are produced in accordance with the varying lengths of threaded nylon line (each with its own resonant frequencies), the acoustic nature of the reverberant platter, and the different spacer lengths off-setting the speaker transducers from each side of the platter (this enables heterodyning within the instrument). The resulting complex sounds are then compounded enormously as a performer touches and warps the platter while the feedback circuit is active. As the platter is manually warped, twisted and pulled downward, the tension on the nylon lines is changed along with their resonant characteristics. This produces long "whaling" sounds which, at times, cause the strings to buzz in resonant arches which may strike the plate itself. While the instrument is incapable of making sound alone, its sonic complexity creates a performer/instrument partnership which is most often devoid of ego due to the inherent instability of the instrument. The audience does not experience the master performer transcribing his version of the Holy Grail, but a companion performer leading them through a universe of richly complex sounds and experiences. Such is the nature of instruments with souls and territory of their own.

### Fayfer Harp(oon)

The Fayfer Harps ("fayfer" is a Yiddish word for an incessant whistler) are also built within a PVC frame and likewise suspend a resonant object on nylon line, this time from eyeloops attached to the four posts of the frame. A single speaker transducer is attached below the resonant metal object for weight and to enable feedback circuits. Attached to the top of the found object is a three foot length of 3/16 inch threaded steel rod which is used to turn the suspended object within the frame creating pitched tones (a brass handle is attached to the top of the rod). The rod also acts as a surface against which a violin bow may be used to extract beautiful overtones as the performer inserts a single finger into the flared brass fitting at the top. The rod is also used as a thoroughfare for washers which spin "like moths" down the threaded rods bringing out the natural resonant characteristics of the instrument. The nylon lines pierce four piezos which are attached to eyeloops connected to the chassis, but here the nylon is allowed to extend away from the instrument and can be used to suspend the instrument, and/or for various sound effects. The most distinct feature of the instrument is the use of four four-foot pine dowels which intersect and travel through the eyeloops on each post. These may be used in numerous ways, one of which is to produce long whistling tones as the dowels are moved to and fro through the eyeloops. Once again, the instrument is amplified for live performance.

### Flutter Harp(oon)

The Flutter Harp is made up of twelve suspended lengths of threaded steel rod each piercing three resonant metal objects. The instrument, which is suspended in three groups beneath a four meter pine board, does not utilize the feedback circuits of the previously described instruments, but rather concentrates on the acoustic qualities of the suspended scrap as brought out by spinning washers made of different metals, rubber, wood and plastics. These washers which spin at different speeds according to the material used and other aspects related to their release, will glide around counter clockwise coils made in the rods, and spin somewhat erratically around clockwise turns. Therefore, in designing the instrument, structural patterns in these coils may



Right: FLUTTER HARP by Dan Senn



TEN TOO LIPS by Dan Senn.

Photo by D. Senn, (1991).

be considered which affect its performance. In my composition called "Flutter Moths", approximately seventy-five points are positioned at the top of each three-foot length of rod where clips are used to temporarily hold groups of washers. The clips, to which nylon line is connected, are pulled away from the rods releasing groups of fluttering "moths" which create a unique running mechanical sound along with a stunning symbiotic visual effect. This piece, which is improvisational in the sense that an external (paper) score is not followed, clearly exemplifies the concept of the instrument acting as the score itself. Lasting from fifteen to twenty minutes, the composition also includes the interaction of one "harpoon" (one of the twelve suspended rods) with another as they sway and crash together in the performance. The piece is concluded when all the clips have been pulled and the instrument physically comes to a rest.

#### Ten Too Lips

The Too Lips are wholly acoustic and, beyond their obvious sculptural attributes, take the "fluttering" aspects of the Fayfer and Flutter Harp into a mobile format. For these, two resonant metal objects are separated by threaded steel rods along which "moths" are allowed to spin. Because the instrument may be handled, it is played like an hour glass, turning it over after the "moths" have spun the distance. At the beginning of a performance, they are handed to the audience members (like flowers) for individual performance and as a means of demystifying the Fayfer and Flutter Harps which are performed later.

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*Sculptor, composer and author Dan Senn has recently left his position as Associate Professor of Music Theory at Ball State University in Muncie, Indiana, to become Director of Newsense Intermedium, a nonprofit organization specializing in presentation of interdisciplinary arts. He is available for performances, installations and lectures. Two cassettes of his music are available: "Music and Texts" (1991) and "Flutter Moths" (1992). Write to Newsense Intermedium, 1933 Commerce #301, Tacoma, WA 98402. ("Music and Text" is also available in Europe under the title "Schmoos Harp Improvisations" from V2 Organization, Muntelstraat 23, 5211 's-Hertogenbosch, Holland).*

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# ON CONCEPTS AND CLASSIFICATIONS OF MUSICAL INSTRUMENTS

Margaret Kartomi

Published by University of Chicago Press, Chicago & London, 1990

Reviewed by Bart Hopkin

An important facet of organological scholarship over the last century has been the creation of classification systems for musical instruments. These systems have been useful for cataloguing purposes, information retrieval systems, museum work, and the like. They have also been seen as means for gaining a conceptual handle on the great variety of musical instrument forms the world over. Meanwhile, just as importantly, instrument classification systems independent of western scholarship have existed in most of the world's cultures for as long as there have been enough instruments to classify.

Margaret Kartomi's *On Concepts and Classifications of Musical Instruments* pulls together a great body of information on instrument classification systems of all sorts, from around the world. It is a unique work, and a great service: many academics have written articles and monographs proposing new systems or critiquing systems previously proposed, and some documentation is available for specific non-western systems as well, but no one previously had produced a broad-based comparative study of instrument classification systems in general.

Kartomi's cross-cultural work is somewhat limited by a shortage of data on instrument taxonomies from many parts of the world. Still, she manages to present descriptions of systems from all the major classical cultures for which the information is there: Arabic, Chinese, Indian, Greek and European, as well as Tibetan and Javanese. Thanks to long literate traditions in those cultures, she is able to present some sense of development over time, as well as an awareness of secondary lines of thought existing alongside the predominant systems. In addition, Kartomi provides a good rundown of the many systems proposed by modern academics, including Mahillon, Hornbostel & Sachs, Hood, Sakurai, Lysloff & Matson, Elschek & Stockmann, and others too numerous to mention. Finally, she reports on a sample of smaller or non-literate cultures, including Mandailing and Minangkabau (Sumatra), T'boli (Philippines), Dan and Kpelle (Ivory Coast and Liberia), 'Are'are (Solomon Islands), and Finnish. Some of the data in this section is derived from her own fieldwork, mostly in Southeast Asia and the Pacific. In some of the smaller cultures, instrument classification systems are not conceived or taught as such in an explicit fashion, but part of Kartomi's purpose is to explore concepts of instruments within each culture, which in turn may imply underlying classification.

The cultural study of taxonomies of all sorts, whether they deal with botany, social structures, cosmology, or musical instruments, is always fascinating. The question of how people choose to divide up and organize their universe — which delineations they choose to treat as meaningful distinctions, and the implied relationships and non-relationships that lie behind those choices — these things provide a unique perspective on the human mind, and on social and material culture. Musical instrument classifications, Kartomi demonstrates, both reflect and influence how people think about, compose, and hear music. Further, she

says, "concepts and classifications of instruments and ensembles are part of a seamless web of cultural knowledge. The process of classification is usually not just a one-dimensional activity resulting in the production of a tersely-structured, systematic set of data. It is frequently a multi-level, creative way of thinking and organizing knowledge about instruments and ensembles in ways that are consistent with socially influenced or structured ideas or belief systems."

The taxonomic systems that Kartomi discusses take a wide variety of forms, and use a wide variety of criteria for making distinctions. Many are primarily morphological in their orientation, taking the physical features of the instruments as the key elements. Thus, instruments with strings are distinguished from those with membranes, and so forth; and progressively more detailed differentiations can be made along these lines. Another common emphasis is playing technique: e.g., struck instruments are distinguished from blown instruments. Many systems categorize instruments based upon their musical function in important ensembles within the culture. Tunings available on the instruments may come into play as well. Equally important — and this is just as true in presumably scientific cultures as in non-literate ones — instruments may have cosmological or spiritual connections, social and hierarchical positions, or cultural/historical associations, which function in their categorization.

A particularly interesting area of inquiry (from my own point of view) is the matter of how western academic systems have developed over the last century. A number of thought-provoking issues have been at play. These recent systems are not, in Kartomi's terminology, "natural classifications" — they did not arise organically in a process of cultural development in conjunction with a body of instruments. They were imposed upon the existing data in an after-the-fact intellectual process, usually the work of an individual. Kartomi points out how, by the late 19th century, ethnographic collections in the west were filling with instruments from around the world. The new awareness of exotic types had stretched traditional western classifications to the breaking point, and ethnographers, museum curators, and musicologists began to see a need to create a more comprehensive system. The call now was for a universal system, free of predisposition to any particular culture, which would be open and expandable to accommodate any conceivable sort of instrument that might come along. To meet that expectation, a system would have to have two qualities: 1) It would have to be logical, meaning that for each progressive step of subdivision a single criterion of differentiation must be found that can be applied consistently and unambiguously. And 2) it would have to be logically exhaustive, meaning that there must be no holes that could leave unforeseen types with no place in the system. Over the years since the issues first arose, it has proven remarkably difficult to meet these prescriptions. The ensuing efforts to purge suggested classifications of cultural bias have been an ongoing exercise in sociological thought. And the struggle to achieve logical consistency and exhaustiveness has been a fascinating intellectual exercise of a different sort — a meditation, really, on the very nature of musical instruments, calling for extensive detail knowledge of the subject, complemented by a lot of insight.

Having said all that, I will add this: While I myself have an intellectual predilection for logical, morphologically-oriented systems, Margaret Kartomi's book gave me an enhanced ap-

preciation for the value of natural classifications. In this context, it's interesting to think about the predominant inherited system in European-derived cultures, the primary division of instruments into winds, strings and percussion, with further subdivisions following. Like many others, I have routinely expressed disdain for this system for its obvious lack of taxonomic logic, since the criteria of distinction are inconsistent and not mutually exclusive (Kartomi quotes Curt Sachs as saying pithily, "We might as well divide Americans into Californians, bankers and Catholics"). But at the same time, it does accurately represent a division of musical functions within the symphony orchestra. It also reflects how most people in the relevant cultures naturally hear symphonic music and to varying degrees other musics as well. It reflects a certain hierarchical thought, too, in which sustaining winds and strings are elevated, while the undifferentiated riff-raff of percussion is sent to the back of the orchestra. In all these ways, the traditional classification is true to its purposes, true to the body of music and cultural associations it serves, and in that sense it is meaningful and appropriate.

"On Concepts and Classifications of Musical Instruments" comes with an extensive bibliography, and a glossary which clarifies many terms whose meaning Kartomi develops in the course of her argument. At the end of many of the chapters are synopses, under the heading "Conclusions," which are valuable to anyone more interested in the big picture than in the details. The book contains relatively little information about instruments in themselves; it is really about sociological phenomena and intellectual processes as they relate to this one aspect of material culture. It will make you think about how you think about musical instruments.

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## INTERVIEWS WITH SOUND ARTISTS

### taking part in the festival *ECHO*. *The Images of Sound II*

René van Peer

Published by Het Apollohuis, Tongelresestraat 81, 5613 DB Eindhoven, The Netherlands. Written in English.

Reviewed by Bart Hopkin

In May and June of 1987, the *Echo II* festival took place at Het Apollohuis in Eindhoven, Holland. Het Apollohuis is an arts performance and gallery space, with countless exhibits and performances, plus several recordings and print publications, to its credit. Under the direction of Paul Panhuysen, Het Apollohuis has consistently supported sound-based arts that do not find much outlet elsewhere. *Echo II*, like the *Echo I* festival presented three years earlier, was designed specifically to highlight this sort of work.

To document the first *Echo* festival, Het Apollohuis published a book entitled *Echo: The Images of Sound*, edited by Paul Panhuysen (reviewed in EMI Volume IV #5). It contained essays by artists who took part in the festival, as well as some who did not, along with several additional features. To document the second *Echo* festival, Het Apollohuis first produced the CD *Echo: The Images of Sound II* (1992), containing recordings by the artists whose work appeared (reviewed in EMI Volume VIII #2). Now, to further document the second festival, Het Apollohuis has released this new book, **Interviews with Sound Artists**

by René van Peer.

Interviews with Sound Artists consists of interviews which René van Peer conducted with thirteen artists who took part in *Echo II*. In most of the pieces the interviewer's questions or comments scarcely appear in the text; the artists' words and thoughts fill the pages with a minimum of interruption. Yet one can imagine the interviewer's invisible hand directing the discourse along certain lines. Rather than focussing on description of particular art works, most of the artists' comments are autobiographical or philosophical. What comes across is not primarily a sense of the mechanics of specific pieces, but a broader sense of the context in which the artists create, and the worlds, inner or outer, that their work reflects. (One exception to the invisible interviewer rule: in the last of the interviews van Peer reveals more of himself as he reflects upon and interprets the comments of the last interviewee, Het Apollohuis' director Paul Panhuysen.)

With its biographical orientation, the book can stand nicely on its own, independent of the *Echo II* CD or the festival, as an exploration of creativity and personality. At the same time, reading the book in connection with the CD adds an important dimension to the subject matter. Where the book has no illustrations and generally does not describe specific instruments or installations in detail, the CD comes with as much graphic and textual documentation of individual works as is possible in a CD-sized booklet. Plus, of course, the CD reveals that essential component, sound. In short, although the two can be enjoyed independently, the book and CD are complementary.

Most of the artists interviewed here are very much interested in the physical nature of sound. They strive to understand and work with physical sound on its own terms, rather than through the traditionally musical parameters of pitch and rhythm. Many are especially concerned with the spatial aspects of sound, and with sound as it relates to its location and its environment. Repeatedly, as you read these discussions, you'll encounter the ideas that sound occurs in space; sound can help define or interpret a space; sound as art should be appropriate to the environment in which it is to occur; sound out of context is anomalous; sound is 3-dimensional and sound-artists should recognize and work with its 3-dimensionality.

Most of the artists manifest an awareness of politics and society, and make an effort to understand where they find themselves in a complex economic and social world. This awareness naturally shows itself in different ways for different artists. But a sense of history, and of internationalism, permeates most of these pages. These are people, in other words, who operate within an awareness of cultural context — one which functions across historical time and across geopolitical boundaries — even when as artists they find themselves operating outside of established cultural institutions.

A complete list of the artists whose words appear in *Interviews with Sound Artists* appears at the end of this review. Meanwhile, here is a handful of somewhat arbitrary notes on a few of them.

Joe Jones comes across with an unassuming, likeable and humorous tone. He scarcely describes his instruments and installations (you can learn more about them from the other Het Apollohuis publications), but he does say this: "I really love my instruments. They are like little children. Each one is an individual, has its own little type. Sometimes it gets a good home. Sometimes it gets a bad home. Just like any orphan." Joe Jones, and Yoshi Wada, also interviewed here, were active in the Fluxus

movement of the 1960s, and they provide some interesting inside history.

Richard Lerman's work for *Echo II* included his famous bicycle spokes piece "Travelon Gamelan", as well as an installation for tuning forks in interaction with long wires and piezo pickups. In his interview he seems less inclined than others to recount his personal history or philosophical stances, but he does talk more about his instruments and installations, and how they work.

It is in Jean Weinfeld's interview that we get the strongest sense of 20th century history, particularly as it relates to European Jewry. Weinfeld, with Bauhaus training as an architect, later turned to making lovely, sculptural stringed instruments — fanciful in shape, yet closely related to familiar string instrument forms.

From Terry Fox's interview you may learn something about musical instruments and sound. But you will learn more about human endurance and consciousness.

Jim Pomeroy brings the strongest political orientation to his interview. Among other things, he brings this perspective to bear on the institutions through which artists make art and make, or try to make, their livelihood at it, and to relationships between artist and audience.

Walter Fähndreich, at *Echo II* and elsewhere, has created installations involving standing waves in a room. The room is carefully measured in all its dimensions, and frequencies for various possible standing waves in the space are then determined based upon those measurements. Strategically located speakers project these frequencies at low volume into the room. The size and shape of the room thus determine the musical pitch relationships. What one hears at different locations in the room varies depending upon where each location falls relative to the nodes and antinodes of the different standing waves. In his interview Fähndreich discusses this, and describes a conceptually similar approach in working with his primary instrument, the viola. Rather than imposing an externally-conceived music on the instrument, he explores the properties of the individual viola, noting its natural resonance responses for different frequencies and the resulting tone colors, and then composes specifically for that viola with its innate characteristics in mind.

ARTISTS INTERVIEWED IN RENÉ VAN PEER'S **INTERVIEWS WITH SOUND ARTISTS**: Joe Jones, Richard Lerman, Jean Weinfeld, Martin Riches, Takehisa Kosugi, Horst Rieckels, Johan Goedhart, Terry Fox, Christina Kubisch, Jim Pomeroy, Walter Fähndreich, Yoshi Wada and Paul Panhuyzen. Three of these artists — Joe Jones, Jean Weinfeld and Jim Pomeroy — have died since giving their interviews for this book.

## THE PINK VIOLIN: A PORTRAIT OF AN AUSTRALIAN MUSICAL DYNASTY

Jon Rose & Rainer Linz

Published in 1992 by NMA Publications, PO Box 185, Brunswick, Victoria 3065 Australia. Distributed in the United States by Frog Peak Music, Box A-36, Hanover NH 03755.

Reviewed by Bart Hopkin

The *Pink Violin* is a compendium of writings and documents illuminating the life of the famous Australian violinist and composer Johannes Rosenberg, along with other members of his celebrated family. Included are interviews, reprints of

newspaper and magazine articles, essays and memoirs from various authors, photographs, sketches and scores. These are presented without editorial comment, and in the cumulative effect they create a patchwork image of an eccentric musical family spanning the decades of the twentieth century.

In addition to his many other pursuits, the book's primary subject, Johannes Rosenberg, was an instrument maker — and an instrument modifier, an instrument deconstructor, an instrument user and mis-user. The starting point for each of his constructions is the violin. The essays and articles in *The Pink Violin* make frequent reference to these re-conceived violins, and many of them appear in photos and sketches. Some examples:

The *triple neck, double piston, wheeling violin* is a one-wheeled object made to be pushed like a lawnmower, with violin necks at the handlebars which apparently can be fingered as one pushes. The details of the mechanism are not clear, but pushing the wheeling violin along somehow generates music. Author Jon Rose explains that "For most composers, to work with the relationship between time and space is enough. But Rosenberg always wished to go further — and with this instrument, the use of distance became a fundamental parameter of his music. Sound could now be measured and expressed in terms of metres and kilometres, as well as hours or days. History could be played in retrograde (backwards) — simply by walking backward, and from the end, back to the beginning again. With this instrument, Rosenberg crossed 4,000 kilometres of the Australian outback in 1960, breaking his own record from two years earlier."

"Anzac Ears" was Rosenberg's name for a project that would have covered vast stretches of the Australian continent with approximately one billion wind-activated, one-stringed, bio-degradable violins spaced out in a rectangular grid pattern. Much of *The Pink Violin's* discussion of this project focuses on the difficulty of obtaining funding for such an endeavor. Rosenberg eventually succeeded in obtaining support from several large corporations including Union Carbide, United Press, and others. Unfortunately, Rosenberg was struck ill as the project was getting underway, and the admittedly ambitious plan was never fully realized.

The Rosenberg Museum, located in Berlin, contains many more of Johannes Rosenberg's violin reconstruction experiments, and photographs of several of them appear in *The Pink Violin*. Among them are the *Madonna* and *Child* cello/violin combination, the 16-string *long neck microtonal* violin, and others.

Jon Rose and Rainer Linz's *The Pink Violin* is a peculiar bird to say the least. I'm reluctant to identify it, for reviewing purposes, as fiction or non-fiction. The book's status relative to factual reality is willfully and playfully enigmatic. But here's a clue: you will understand the life of Johannes Rosenberg better if you know a bit about some of the creative pursuits of *The Pink Violin's* authors. If you don't... well, no matter. *The Pink Violin* made me laugh frequently and ponder occasionally. Half the time I laughed at unexpected absurdities within the book itself, and half the time I laughed at myself for never being quite sure what to make of them.



## RECORDINGS REVIEWS

By Tom Nunn, René van Peer & Bart Hopkin

ART OF PRIMITIVE SOUND:  
MUSICAL INSTRUMENTS FROM PREHISTORY

On CD from Walter Maioli, Via Garassani 2, (SV) Toirano, Italy; or from Hic Sunt Leones, c/o Stefano Musso, Via Taramelli 60, 20124 Milano, Italy

For years Walter Maioli has done research into instruments from prehistory and pre-industrial cultures, collecting and reconstructing them. He studied them during extensive travels around the world. He wrote a book about them (English translation not available, it seems); he made a video-compilation featuring various instruments from Papua New Guinea. He devised a method to teach children how to make and play them. He exhibits his collection and does workshops with the instruments.

On this CD he demonstrates a vast array of instruments that were (or may have been) used in the paleolithic era. There are various winds, idiophones and bull-ropers. To me this issue is partly successful. It is great to get an idea of what these instruments must have sounded like. Some combinations do work very well. I can get along with him when he uses them to imitate sounds from nature. However, neither his evocation of rituals nor his organization of the sounds into musical pieces can really convince me. In his compositions the sounds at times get crammed together, leaving the listener too little opportunity to get acquainted with the individual character of the instruments. And I do feel uncomfortable about his statement that recording took place in the natural environment — twice hearing a car accelerate somewhere in the background.

On the other hand, Maioli is a skilled musician and he gets stubborn whistles and flutes to whisper, screech and buzz. Then there is this stalactite gong in a cavern close to where he lives: ten seconds of the deepest boom I ever heard. There is an instrument that consists of two pebbles and the palm of his hand; with a clever use of echo and the position of his hand he manages to draw magic from utter simplicity.

Most stimulating about Maioli's work is the link he forges between instruments of 25,000 years old and contemporary practice. I am convinced that with a clearer approach to the context in which these instruments may be sounded and recorded, and with more adequate funding, his work could be presented in a truly magnificent package. I see it all before me: several CDs in one box, with a large size book full of information, building instructions, drawings and choice photographs; using primarily recordings of such instruments by non-industrialized peoples today, and Maioli's demonstrations on his instruments if no good current examples can be found. Until then this CD provides the most comprehensive collection extant of primordial soundings (as far as I know), and as such it is not to be missed by anybody interested in sources of sound.

—RV

FROM SCRATCH: SONGS FOR HEROES

Rattle Records, Ltd., Box 4187, Auckland 1, New Zealand/Aotearoa

This superb CD with Philip Dadson, Neville Hall, James McCarthy and Walter Muller (From Scratch) pays homage to "the little known and unsung heroes of past and present, spiritual heroes who have helped raise the consciousness of humanity." The ensemble uses both traditional percussion instruments (bass

drums, roto toms, cymbals) and original percussion instruments (tuned open PVC pipes, bowed "zitherum drums" and "tone trees"), as well as soprano sax, harmonicas ("piano horns"), voices and hand-clapping. (For a description of the instruments, see EMI Vol. VI, No. 4.) The physical arrangement of these instruments into percussion "stations" is both practical and aesthetic, as can be seen in one of the color photos in the accompanying notes. The original and traditional instruments work well together creating a unique ensemble sound.

The "compositions are highly structured and invariably seamless in that they move through contrasting modules of rhythmic/melodic material without a break." Great emphasis is placed on syncopation, asymmetrical meters and phrase lengths, and hocketing (the rhythmic alternation of different voices forming the impression of a single rhythmic line). The only nonrhythmic pieces are the first, which features drone harmonies of the bowed zitherum drums, and the last, a beautiful performance of Tibetan chanting.

It should be pointed out how damned difficult it is to play asymmetrical meters and hocketing accurately. This group makes it sound easy — don't believe it! Their vocal hocketing with simultaneous hand-clapping is, from an ensemble standpoint, virtuosic. Indeed, From Scratch is a tight group in the best sense of the word. Their grace and naturalness masks the sweat and tedium that goes into making something like this come off. The composition itself is also fine work, consisting of eight sections forming a journey through different sonic areas defined by instrumentation and rhythmic/tempo character.

*Songs for Heroes* is well recorded and finely packaged, a fascinating exploration of rhythm, sound, and spirit well worth investigating. And From Scratch is a remarkable percussion ensemble I hope to hear more of in the future.

—TN

WILLIAM GREEN: *ESION ASSEMBLAGE: DARK TRAVELLER*

On cassette from Casa Verde Tapes & Software, 1545 East San Carlos Place, Orange, CA 92665

An article in the last issue of EMI by David Barnes describes his work as an extension of the ideas of other builders whose instruments he had read about in EMI. Thank goodness this can be the case without fear, ownership or litigation! This is what EMI is about. *Esiom Assemblage: Dark Traveller* by William Green is a superb example of such a situation. The composer was inspired by an article in EMI by David Myers (Vol. V, No. 5) describing his work with feedback systems, wherein processors are used as sound generators as well as processors. Minute levels of internal "system noise" are loop-fed through a series of processors and amplification to produce electronic music. Green describes his set up as "an aural feedback loop comprised of delay and flange pedals, a graphic equalizer, a pitch shifter, and its organic component, William Green."

*Dark Traveller* is an electronic soundscape conjuring a vast space, empty of any foreground images or characters, yet compelling in its simple beauty. A definite sense of some time and place can be felt without knowing what time and place it might be. With long, overlapping envelopes of sound, filter sweeps, and wonderfully natural shifts of overall density and tessitura, the music is a continuous unfolding of sound energy that easily becomes hypnotic, releasing our own visual imaginings. Waves within waves, pulsations on simultaneous different levels of perceived time, wind-like filtered noise, rainstick sounds and muffled engine sounds all contribute to an engaging (and peaceful) music.

*Dark Traveller* is an excellent example of what can come of

networking and sharing ideas. EMI, as well as William Green, can be proud of this one!

—TN

**MICHAEL MASLEY: MYSTERY LOVES COMPANY and SKY BLUES**

On cassette from Michael Masley, Tonehenge Productions, P.O. Box 5232, Berkeley, CA 94705

Michael Masley has designed and innovated several instruments [see the article in this issue of EMI]. Most conspicuous of these innovations is his work on the hammers of the cimbalom, the Hungarian hammered dulcimer. Wearing picks on his thumbs he has eight hammers attached to his fingers (instead of one in each hand) with which he strikes and "bows" the strings. The tapes are built around these techniques. On *Mystery* Masley hosts guest-musicians on guitar and tabla, playing keyboards next to his self-built instruments. The latter are featured exclusively on his solo project *Sky Blues*. Even though Masley seems to be a dexterous sound-engineer, when the cimbalom gets paired with the other instruments, its outstanding timbres suffer from these companions. The second tape shows the versatility of the hammers quite neatly "Masley plays the strings with bare (though resined) fingers also" adding new dimensions to the cimbalom.

By the way, if you consider music that is reminiscent of New Age inducement to meditation not cool, you'd better avoid this stuff.

—RvP

**HANS REICHEL: SHANGHAI ON TOR ROAD**

On CD from Free Music Production, PO Box 100227, 1000 Berlin, Germany

Can David Cronenberg be fun? How about music that sounds as if it was produced by a cross-breed of animals, humans, cartoon-characters and instruments? Can this be what the future, helped by sinister scientists, has in store for us?

The World's 1st Operetta Performed on Nothing but the Daxophone. This cover text is superimposed over a picture of beautifully modeled timber. In Vol. IV #3 of *EMI* Hans Reichel described this idiophone — novel descendant of the ruler. Sounds struck or bowed from it are amplified through pick-ups. He changes the pitch with a wooden block, of which two sides are curved. The variety of shapes of the daxophones themselves make for an equal variety in sounds and timbres. For their characteristics I want to refer to Reichel's article — I will not pretend that I can add anything substantial to his (in part quoted) descriptions.

On this 70min CD Reichel demonstrates the extent of the instrument's sonic capabilities. That so many different sounds can come from such a simple, analog tool is almost beyond belief. He has carefully woven layers of them into tunes. His choice to throw them into the mold of entertainment music, however, may give one the feeling of listening to a joke (one of the tracks is called *Py & the Jamas*). Don't mistake me: many sounds are great; the album has hilarious moments. The music seems to roam around in the realm of the Residents — and similarly to raise the question whether it wants to be taken seriously.

—RvP

**SILENCE IV: MACHINATIONS**

On CD from Mélodie Théâtre, 44 Rue Pierre Renaudel, 76300 Sotteville-lès-Rouen, France

The fact that this CD came my way suggests an emphasis on uncommon instruments in Silence IV's music. Only the first four tracks do contain anything like it, however. There is a "Xyl'cauphone à tambour" (or Dripsylo, as we would possibly call it); there are kitchen utensils in a granny cupboard struck by mallets, operated through a system reminiscent of street organs — at least that is my conclusion from the photograph on the insert. And

then there is music. Just like that. Once the music has taken over, it keeps on rolling. Quite nicely, I should add. Something like the French branch of jazz oriented rock, with a fat slice of "avant garde" (vaguely in the tradition of Magma) and a pinch of "Les Compagnons de la Chanson." Denis Brély stands out on saxophone.

Brély is also the man who designed the musical machines employed by the band. They look like the realization of a musician's nightmare during a period when his house is under reconstruction: wild hybrids of any conceivable tool or household object and regular instruments mounted on it, with a driving device to complete the whole. A pamphlet I received with the CD mentions 10 different contraptions. More's the pity that so few are presented so shortly on the recording.

—RvP

**VARIOUS ARTISTS: THE AVANT WORLD JAZZ NOISE PROJECT: AN EXPERIMENTAL MUSIC COMPILATION**

On cassette from Pointless Music, 1889 Algonquin St., Kent OH 44240

This is the most recent cassette compilation from Pointless Music, whose earlier compilation *Postal Sound Surgery* was reviewed recently in EMI (Vol. VIII #3). Quite a few of the twenty-four pieces included on the current tape use unusual instruments or unconventional sound sources of one sort or another.

The music gathered here is diverse in style and mood. Some pieces are noisy and some are pretty; some are agitated and some are meditative; some work with controlled parameters of pitch and rhythm and some focus more on the nature of sound in itself. A lot of the music strikes me as good natured, crazy-fun, and often humorous. The best examples manage to achieve this without sacrificing a hard edge and an outside feeling. Many pieces incorporate the manipulation, twisting and unlikely juxtaposition of recognizable pre-existing styles. Most of the music has a loose, rough and free feel to it; none feels pre-packaged; but it's worth noting that, particularly among some of the manic ensemble episodes, there are couple of great band arrangements here.

Notes on a few specific pieces of interest to EMI people:

John Heron's "Snack Latin" uses an array of homemade percussion to create bird-like sounds and a rainforest feel. Barry Chabala's "Travellin' Nuts" bubbles up from an underwater clarinet. Is that a balloon squeaking, or what, on Frederick Lonberg Holm's "Off the Record"? Hal Rammel's Sound Palette, a bowed idiophone described in EMI Vol. VIII #4, solos in "Sound Palette Solo". "Bugged Again and Twice as Much" is a duet for two of Tom Nunn's Bugs (contact-mixed plywood boards loaded with various small sound makers). "One", by Bil King, is a very tasty, very short solo take of his long board zither with pickup called the board. Henry Kuntz' "Sea Smoke" is a textured babbling of music box chime sounds, sampled? "Live at Peabody's" features a whole array of acoustic and perverted electronic instruments created by John Hajeski, Barry Chabala, Mike Hovancsek and Reed Ghazala (Hajeski, Chabala and Hovancsek play on the piece) "take the time, when you listen, to focus on and enjoy the different sound qualities that swim in the stream."

Artists included on the tape not mentioned above: Fatthi El Dabhi, Hank Tilbury, Shaking Ray Lewis (his "Hoof Poof" is joyous), Karl F. Gerber, David Westling, The Entropics, Grouse, the Billy Tipton Memorial Sax Quartet, the Disgruntled Postal Employees, Vinyl Back (their "Versteckenhausen" is outrageous fun), Crawling with Tarts, and Paul Guergerian.

—BH

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Recordings for review may be sent to EMI at PO Box 784, Nicasio CA 94946, or directly to the reviewers: René van Peer, Bachlaan 786, 5011 BS, Tilburg, Holland; or Tom Nunn, 3016 25th St., San Francisco, CA 94110, USA.

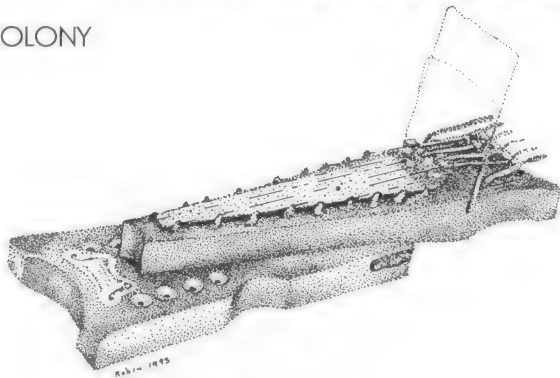
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## INSTRUMENTS FROM THE MARX COLONY

by Bart Hopkin

A few months ago one of EMI's readers brought to my attention an item in the *Elderly Instruments* 1992 catalog of acoustic instruments and accessories (1100 N. Washington, P.O. Box 14210, Lansing, MI 48901). It was a half-page display showing several curious instruments from the Marx Music Company of New Troy, Michigan. The Marx company marketed a variety of unique designs through most of the first half of this century, the text explained. When they went out of business in the early 1960s, a large stock of the instruments was left to gather dust in the warehouse. In 1991 the surviving inventory was offered at auction. The people at Elderly managed to capture a portion of that inventory, and that's how these rare instruments came to be offered in their catalog.

I contacted Jerry Spencer at Elderly, and he generously offered to send me whatever historical material on the instruments he could lay his hands on. More, he agreed to send some of the instruments on loan to allow me to study and photograph them for this article (and have some fun playing them, too). A short time later three instruments arrived: a single-string long neck lute with a special steel slide made to ride permanently on the string; an admirably simple rudimentary violin; and — the prize of the collection — a small bowed-and-hammered zither of most extraordinary design. I will describe the instruments more fully, but first, let us begin with some history.

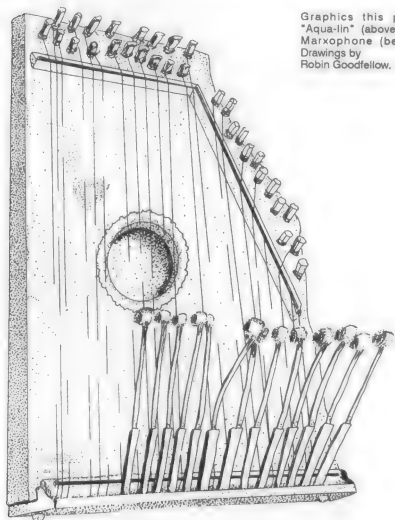


Henry C. Marx was a violinist, living in Boston and later Chicago in the years following the turn of the century.<sup>1</sup> Finding it difficult to support his family by teaching, he turned to peddling musical instruments door-to-door for an instruments manufacturing company out of Boston (possibly the Phonoharp company). His son Charles quit 9th grade to join him. Around 1915 the two managed to set up an instrument making factory of their own.<sup>2</sup> Perhaps following insights gained from their door-to-door experience, their intent was to design, make and sell new types of instruments that would be easy to play.

For the next 30 years and more, father and son worked together. The company did well. In 1927 they moved the factory to the 30-acre site at Troy where the building, now boarded up, still stands today. A Marx family home was built there, plus six cottages for workers: H.C. Marx had a dream of building a town around his enterprise; he called the place "The Marx Colony" and printed the legend "From the Marx Colony" on instruments and promotional brochures. The company had its heyday in the 1930s and into the 40s, with ten-to-twelve employees turning out three-to-four thousand instruments a year.

In 1948 H.C. Marx died. His son Charles fell ill sometime later. The factory eventually closed, and Charles died in the 1970s.

Throughout their productive years, Charles and H.C. Marx experimented with new designs, bringing to market instruments with names like *Marxolin*, *Marxochime*, *Pianolin* and *Hawaiphone*. One mainstay of their business (unfortunately not included among those that I have on loan from Elderly Instruments) was something called the *Violin-Uke* (Figure 1). "Own one and be up to date!" urges a promotional flyer. It was a wire-strung zither, played simultaneously with a thumb-pick and with a small bow. There is no fingerboard; the sixteen bowed strings, running along the two sides of the instrument, are tuned diatonically and played open. To bow an individual



Graphics this page:  
"Aqua-lin" (above) and  
Marxophone (below).  
Drawings by  
Robin Goodfellow.

1. Much of the information in this account comes from the article "Father, son worked in perfect harmony" by Chris Benninghoff, which appeared in 1991 in a Michigan newspaper. Benninghoff apparently gathered the information through an interview with Edna Marx, widow of Marx Music Company's H.C. Marx. Other information given in the current article was gathered from conversations and correspondence with Jerry Spencer of Elderly Instruments, Lansing, Michigan. Especially valuable, in addition, were conversations with Becky Blackley, whose extensive knowledge of the autoharp and its history has given her familiarity with the commercial history of related zither forms such as the Marxophone.

2. This date, apparently provided by Edna Marx, contradicts a promotional claim appearing on surviving Marx Company brochures, "The Finest Stringed Instruments Since 1896."



string, the player uses the technique associated with the triangular "bowed psalteries" that some contemporary makers have produced: the strings pass over small individual pin-bridges at one end. Each successive string extends a bit beyond its neighbor's end point before crossing its own bridge, and this leaves a small segment just short of the bridge where it can be bowed unobstructed. The sixteen strings in the center are inaccessible to the bow. They are the plucked strings, apparently designed to be tuned chordally. The idea is that the player, with thumb-pick on one hand and the bow in the other, strums an accompaniment to the bowed melodies.

Another important Marx instrument was the Marxophone, (Figure 2). The Marxophone is a many-stringed, wide, flat zither, sized right for playing on the lap, and similar in shape to an autoharp. The strings are to be tuned diatonically in C. The courses toward the left are arranged in several groups of four, each group tuned to produce one of the primary chords in the key of C. As with the Violin-Uke, these courses were designed for strumming with a pick, providing a chordal accompaniment. The remaining strings — the melody strings — are tuned scalewise. Mounted at the lower bridge is a set of mallet-like hammers with wooden, metal or felt heads, extending out over the melody strings on springy arms. There is hammer for each melody string. The player presses near the base of the appropriate hammer, sending the hammer down to strike the string and sound the desired note. The lower portion of the hammer lever actually stops against a check just short of where the hammer would normally strike the string, but under the hammer's momentum causes the springy arm to flex, allowing the hammer to strike the string and then rebound back upward of its own accord. The springiness then causes it to continue bouncing up and down on the string in a rapid tremolo, for as long as the player holds the hammer lever down. The player uses the hammers to sound the melody over the strummed chordal accompaniment.

H.C. Marx obtained a patent on this spring hammer mechanism in 1912. This was when Marx was working in Boston, possibly for the Phonoharp Company, shortly prior to the founding of his own company. In any case, Marxophones were first made by Phonoharp (which ceased operation in 1928), and later by International Musical Corporation (1926 - 1931), and Oscar Schmidt-International (1936 - present). The corporate history of these three companies is intertwined, as the entities at various times merged, changed names and re-incorporated. Ironically, the Marx company doesn't seem ever to have made Marxophones. A large number of Marxophones were manufactured and sold, and some are around even today, still played by a small group of enthusiasts at folk music festivals and the like. The Oscar Schmidt-International company is still around, long since having ceased making Marxophones but well known for its autoharps.

FIGURE 1: The Violin-Uke, from a promotional flyer. "Own one and be up to date!"

## Violin Uke



Manufactured by

**MARX MUSIC CO.**

**Most UNIQUE Instrument Made**

Experimental Musical Instruments

35

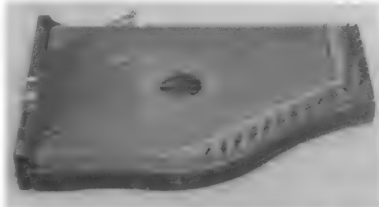
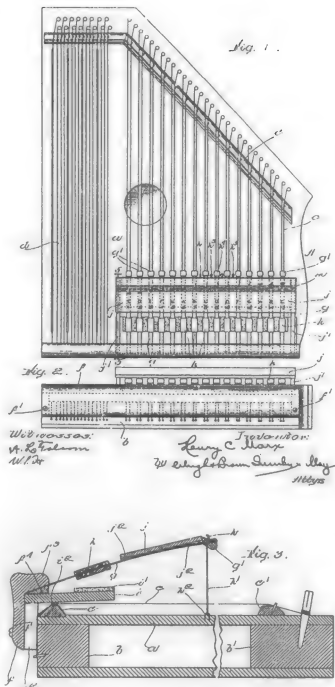


FIG 2 (this column):

Top: Figures from the spring-hammer patent. The side view below shows the hammer mechanism.

Photo above: Marxophone by International Musical Corporation, from the collection of Robin Goodfellow.

Photo at right: Marxophone from Oscar Schmidt International, Inc., from the collection of Becky Blackley. (photo by Becky Blackley).



FIGURE 3: Music tablature, created by the Marx company for use with any of the Marx instruments.

No. 505  
Price 10¢

Down By The Old Mill Stream  
MARSHALL CO., NEW TROY, MICH.

5 4 | 5 1 9 10 11 10 9 1 8 9 10 1 8 1 1  
7 1 6 1 7 8 1 6 1 5 1 8 1 10 1 9 1 10 1  
9 1 5 1 10 1 9 1 10 1 11 1 10 1 9 1 5 1 8 1 9 1  
9 1 10 1 10 1 10 1 12 1 11 1 10 1 10 1 6 1 6 1 10 1 10 1  
9 1 5 1 CHO. 12 1 13 1 11 1 5 1 6 1 10 1 9 1 8 1 3 1  
5 1 8 1 7 1 6 1 5 1 6 1 7 1 6 1 5 1 8 1 10 1 12 1  
13 1 11 1 5 1 6 1 10 1 9 1 8 1 8 1 7 1 8 1 9 1 9 1  
8 1 7 1 8 1 10 1 11 1 10 1 6 1 10 1 8 1

As part of their music-made-easy program, the Marx company published song sheets with melody and chords for popular tunes of the day — “Old Black Joe,” “Home Sweet Home,” “In the Good Old Summertime,” and others no longer so well remembered (Figure 3). To make them accessible to non-music readers, the song sheets used a special notation-by-numbers system keyed to numbered charts under the strings of the various Marx instruments.

When the Marx Company went out of business thirty years ago, the old factory was boarded up. Everything within remained as it had been. Along with the inventory of finished instruments, there were shelves of experimental prototypes — a great many of them, in various stages of construction. A lot of good machinery and power tools, too, were shut up inside. When the place was opened and the auction took place in late 1991, the experimental prototypes were sold off in lots, a shelf at a time. Some auction goers took home some interesting prizes.

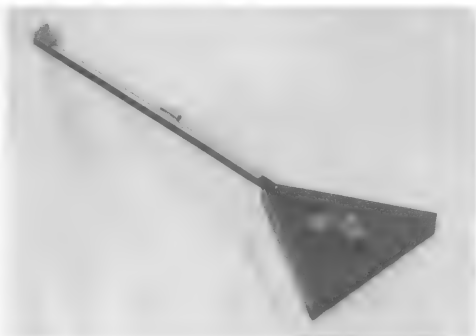
And there ends the story — as much of it as I have managed to piece together, at least — of the Marx Music Company of Troy, Michigan. Let us now look more closely at the three Marx instruments I have here in hand.

It's hard to determine just what each of these three instruments were called. All have labels identifying them with the Marx Company, but none give an instrument name, and none match the instrument descriptions that appear in the surviving Marx Company literature I have obtained. So I will stick with the affectionate nicknames that the people at Elderly Instruments have given them ... starting with the —

## PIK-NIK.

The Pik-Nik (Figure 4) is a long-necked lute with a small triangular sound chamber. Its most notable feature is the cylindrical metal slide riding permanently on the string. The string actually passes through a hole running lengthwise through the slide. The player moves the slide up and down the string to alter the effective vibrating length, and there's a chart printed on the neck below the string indicating slide placement locations for different pitches. Apparently the instrument was intended as a plucked string melody instrument — in any case, due to certain features of the bridge design, it sounds better plucked than bowed. The action is quite

FIGURE 4: THE PIK-NIK. Total length 28 3/4"; sounding string length 26"; triangular body 10" each side and 1 1/2" deep. One fairly thin gauge steel string (.25mm), with a zither pin for tuning. Simple construction of hardwood, using wood screws and glue. Body stained red; bridge and nut painted gold. The most unusual feature is the cylindrical slide that rides permanently on the string.



high, and even at high tensions the string sags a bit under the weight of the heavy slide. The result is that, chart or no chart, slide locations for specific pitches tend to be variable and intonation a little wobbly. The tone is thin, as you might expect of an instrument with this sort of construction. Could there have been some other intended playing technique, one that I haven't thought of, that would alleviate the wobbly pitch problem?

## SIMPLIFIED VIOLIN

The Marx Company's violin (Figure 5) seemingly represents an attempt — reasonably successful in the end result — to make the most rudimentary possible thing that will still play more or less like a violin. It is narrowly triangular in body shape, but for the fact that what would have been the narrow point of the triangle is truncated. (It somewhat resembles the violins of the 19th century innovator Félix Savart in body shape, but the resemblance stops there.) The four strings are scaled to match the violin, and will take a violin tuning. The arrangement of the headstock, neck, fingerboard and bridge is quite unconventional, as described in the caption for Figure 5. There is no bass bar (the long strut in conventional violins glued to the underside of the soundboard beneath the leg of the bridge under the lowest string). There is something like a sound post (in conventional violins, the upright post wedged between the front and back of the soundchamber, underneath the bridge leg on the treble-string side), but its placement is unorthodox. The tone of the instrument is reasonably violin-like, though weaker in volume, and having a thin quality.

## THE AQUA-LIN

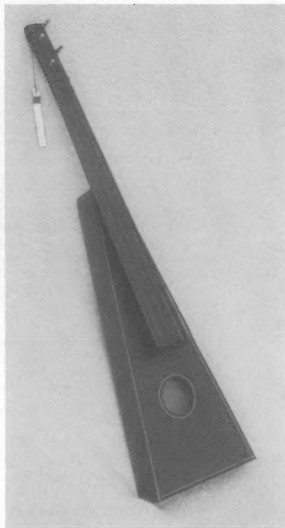
The people at Elderly have been calling this instrument the Aqua-lin because of its glamorous blue-green airbrush finish (Figure 6). A great deal more care seems to have gone into the design and construction of the Aqua-lin, and it will take a bit more effort to describe it here.

The instrument is designed to be played by simultaneous bowing and hammering. With one hand the player controls the bow. With the other, he or she operates a set of small spring-mounted lever-hammers that are attached to the instrument

3. For complete historical information on these manufacturers, see Becky Blackley's *The Autoharp Book* (CAD Publications, PO Box 504, Brisbane, CA 94005).

FIGURE 5:  
THE SIMPLIFIED VIOLIN. Total length 22 1/2". Sounding string length 13 1/4". Body 5 7/8" wide at the base; 14 3/16" long; 1 1/2" deep. There are 4 zither pins for tuning, and a small separate tuning wrench is included. Woods and construction techniques are similar to those described for the Pik-Nik above.

Notice that the headstock, neck and fingerboard are all of a single straight piece of wood. The bridge is actually attached to the end of the fingerboard, and the two legs of the bridge, pressing against the soundboard, support the end of the fingerboard. Thus, the entire stress of the strings is carried on this single straight piece of wood; the sound box is not subject to tension from the strings. An additional wood screw passes through the fingerboard, through the space between fingerboard and soundboard, and into the soundboard, holding the bridge/fingerboard assembly snug against the soundboard. The strings wrap around and are attached to pins on the underside of the fingerboard, eliminating the need for a tailpiece.



similar to those described earlier for the Marxolin. The idea was that the bowing would provide a sustained melody while the hammers fill in a chordal accompaniment.

As with the violin-uke described earlier, the player bows the open strings, using the bowed-psaltery approach to select which string will sound: the 18 strings are set on small individual bridges, with each successive string extending a bit beyond its neighbor, making a short segment of each string accessible to the bow. This makes it possible to bow each string individually. Yet there's another special feature: the bow that originally was provided with the instrument (not available through Elderly Instruments) was actually a double bow, with two courses of hairs running parallel (see Figure 6). The two courses are spaced the right distance apart to allow for playing two adjacent strings on the Aqua-lin at once.

The intended tuning arrangement for the strings is diatonic. The lowest notes are naturally on the longest strings

at the center, with the major scale ascending left-right-left-right from there, in an arrangement reminiscent of that which appears on kalimbas and koras. This layout has proven immensely fertile in African music, and it suits the purposes nicely here as well: while you can play in scalewise motion with an easily-mastered side-to-side technique (mostly a matter of simply tilting the bow to play one side of the instrument or the other), you can also use the double bow to play in parallel thirds since, in this configuration, adjacent strings are a third apart. The Aqua-lin that I examined hadn't been tuned in thirty years. I set out initially to tune it up to the intended pitch level, indicated by note names appearing on the chart affixed below the strings. But when I saw how much tension I was subjecting the thing to, I relented, and opted for the more cautious approach of tuning a whole-tone low. The tone is plenty bright even at the lower pitch level.

There are four hammers for sounding chords. Through the spring-mounting mechanism, they produce tremolo of diminishing volume that lasts a second or two, depending on how hard the player pressed before releasing. Each hammer has a wide head, so that it strikes not one string, but three. These usually are adjacent strings, yielding (given the tuning in thirds) a triad. The hammers really produce quite a clatter, very loud and bright. The

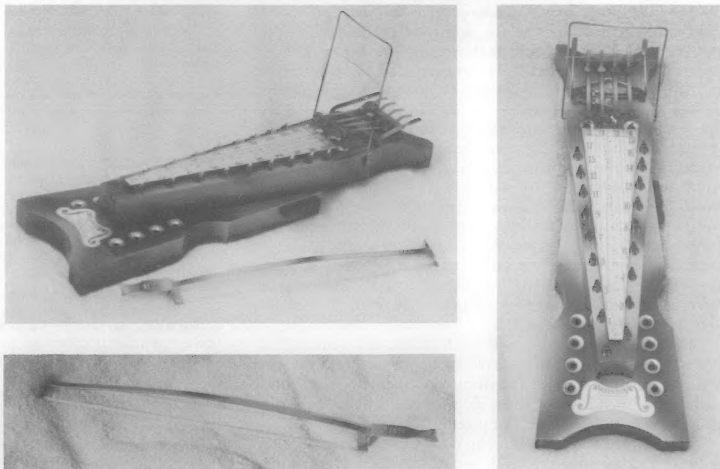


FIGURE 6: THE AQUA-LIN AND BOW.

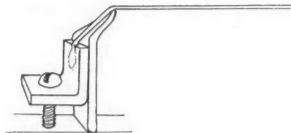
Total length 20 1/8"; maximum width 6 5/8"; sound chamber depth approximately 1 1/2" each for the upper and lower chambers. The 18 strings range in length from 2 7/8" to 13 3/4". They are tuned by an unusual lever-bridge arrangement with machine screws for adjustment shown in Figure 8. There are 4 spring-mounted hammers and levers controlling tangents for altering string pitches. There's a collapsible wire music stand attached. A total of 11 tiny soundholes pierce the instrument, with inset decorative metal linings. The opaque blue-green finish hides the wood, but the wood appears to be similar to that used in the other instruments, though the assembly work is more refined.

The bow for the Aqua-lin (not available with the instruments currently to be had through Elderly Instruments) uses a light-weight piece of flat steel bar stock, flexed to apply tension to the bow hairs. The tension can be adjusted by setting a catch at the end of the stick into one or another of a set of notches in the bow handle. The hairs appear to be natural horsehair. There are two courses of bowhair, spaced the right distance apart to allow for bowing two strings at once on the Aqua-lin.



FIGURE 7 (above): The spring-mounted chord-hammer mechanism.

FIGURE 8 (below): The Aqua-lin's string-tensioning mechanism. Tightening the screw pulls down on the metal piece to which the string is soldered, drawing the string tighter. Most of what is shown here is below the surface of the soundboard, accessible through a hole bored in the board, with just the tip of the bridge protruding. A small screw driver for tuning comes with the instrument, and there's a little hole in the back of the instrument for storing the screw driver away when it is not in use.



player must develop a controlled technique to avoid drowning out the bowed melody with the hammered chords.

Two additional levers to the sides of the hammers control tangents, which come up against the strings from below like temporary bridges to shorten their sounding lengths and alter the resulting pitches. One lever makes a single wide tangent come up against all of the strings, raising each by a semitone — useful for bowing accidentals, or for simply raising the key of the whole instrument. The other raises four specific strings by a whole tone, which has the effect of broadening the range of chords you can get from the hammers. The total collection of chords that becomes available with and without tangents seems a slightly odd choice for the old-timey music the instrument was made for, becoming especially eccentric when you include the chords that arise when you press down both tangent levers at once. But I've noticed that if you tune all the open-string Fs to F# (contrary to the markings on the instrument itself), putting yourself in the key of G, the available chord set suddenly makes sense.

The Aqua-lin's string tensioning mechanism for tuning purposes is a most unusual one, involving the screw-tensioned lever system shown in Figure 7. The strings are soldered permanently to their anchor-bridges, with the idea, apparently, that the heavy-gauge strings will never need replacing.

The body of the Aqua-lin is an odd two-tiered shape. Two entirely separate soundboxes sit one on top of the other, joined by three screws but held 1/16" apart by small spacers between. What was the reason for this dual design? I do not know.

*For information on purchasing these instruments, or to obtain an Elderly Instruments Catalog, contact Elderly at 1100 N. Washington, P.O. Box 14210, Lansing, MI, phone (517) 372-7890.*



THE ANDERSON ARTS CENTER in Kenosha, WI presents "The Sights and Sounds of Music" featuring works in various mediums and techniques incorporating music as a theme from June 26th to September 13, 1993. Included in the exhibition are musical instruments by Dean Eckmann, Jim Fish, Jack Hoag, David Holmes, Hal Rammel, and Richard Shockman. As a special exhibitor, the G. Leblanc Corporation will feature instruments as sculptures. There will be several musical performances in connection with the show. Call (414)653-0481 for details. [9-1]

SOUNDWATCH '94, a two week festival of sound-based art, involving installations, performance, video screenings, seminars, radio art and multimedia work, is scheduled for April '94. Proposals sought for intermedia performance, installation & events, sound performance, sound installation & sculpture, street events and outdoor performance, audio works, and moving image. Proposal deadline August 31, 1993. Send to SoundWatch '94, Artspace, P.O. Box 4506, Auckland, New Zealand, Phone/Fax (649) 303-4965. [9-1]

Newly released: **The Just Intonation Primer** by David B. Doty, a complete introductory text on the theory and practice of Just Intonation. Cost \$7.50 plus postage & handling, or free with new membership to the Just Intonation Network. For information: The Just Intonation Network, 535 Stevenson St., San Francisco, CA 94013, Phone:(415)864-8123 FAX:(415)864-8726. [9-1]

Sale! **SCRATCH MY BACK; A PICTORIAL HISTORY OF THE MUSICAL SAW AND HOW TO PLAY IT**, by Jim "Supersaw" Leonard. Prepaid U.S. \$15 per book, includes mailing (\$22.95) value. KALEIDOSCOPE PRESS, Janet E. Graebner, 28400 Pinto Drive, Conifer, CO. 80433-5309. [9-1]

THE POWER OF SOUND is a major new program on the use of sound and music in therapy, health, and personal transformation, offered by the Institute for Music, Health & Education. Takes place over four 3-day sessions from fall 1993 through summer 1994. For information: P.O. Box 4179, Boulder, CO 80306; phone 303/443-8484. [9-1]

"LARK IN THE MORNING" is currently looking for collections and individual musical instruments to purchase. If you have anything for sale or are aware of anything for sale please contact us. We are interested in strings, woodwinds, brass, percussion, drums, ethnic instruments, bagpipes, traditional and folk instruments. Antique items, used items, instruments needing repair; you name it. We also have a stock of all types of instruments for sale. P.O. Box 1176 Mendocino, CA. 95460; (707)964-5569. [9-1]

LEONARDO JOURNAL is published 6 times a year, including an annual Leonardo Music Journal. We seek subscribers (\$65, c/o MIT Press, 55 Hayward St., Cambridge, Mass 02142-1399, USA) and seek composers and instrument builders interested in writing about their work (672 South Van Ness, San Francisco, CA 94110, USA). Our latest issue featured the CD "Interaction: New Music for the Gamelan" and articles on experimental musical instruments sometimes based on the use of the computer, and music performance in unusual contexts or formats.

FREENOTES — Beautiful Music Made Simple. Freenotes are bar-percussion instruments that make playing music easy for anyone. Designed during a two-year residency with the Paul Winter Consort, Freenotes are useful ensemble additions as well as first instruments for beginners. Priced from \$165.00. For info call or write: Richard Cooke, P.O. Box 1492, Moab, UT 84432, (801)259-4411.

SOUND STORIES #1, a video by Phil Dadson. 60-minute video featuring 14 leading American experimental musical instrument builders — a unique presentation of a unique subject. Available from Sound Stories, PO Box 66060, Beachhaven, Auckland, New Zealand. VHS: \$60 NZ; SVHS: \$75 NZ, postage included, payable by bank cheque only. [9-1]

PLUCK is a newsletter devoted to the Jew's harp. Subscriptions are \$10/year (3 issues) and help support the annual Summer Valley Jew's Harp Festival. Free sample available: POB 14466, Seattle, WA 98144. Please make checks payable to Gordon Frazier.

Bill and Hillary were on a post-election bus tour, realizing that popular support is key to getting the presidential agenda through congress. Somewhere in Arkansas they pulled into a gas station, where Hillary and the gas station attendant greeted each other joyously, with the warm embrace of special friends. After they got back on the bus, Bill said "Who was that guy?" Hillary answered, "Oh, just an old high school sweetheart." Bill thought about this a moment, and then said, "Well, aren't you glad you married me?" "Why?" Hillary innocently asked. "Because he's a gas station attendant. I'm the president!" "Yes," Hillary answered, "but if I'd married him, he'd be president. You'd be a gas station attendant."

**Furniture**, a bi-monthly journal, seeks submissions of scores, short essays, etc. in the following areas: indigenous musics of North America, soundscapes and ecology, sound poetry, text-music theory. Include SASE for return. We also review recordings. Send to: Mark Nowak, 227 Montrose Place, Apt. C. St. Paul, MN 55104.

**THE TUNING OF THE WORLD**, the First International Conference on Acoustic Ecology, will take place August 8-14, 1993 at the Banff Centre for the Arts. For information write the Conference Registrar, The Tuning of the World, Banff Centre for the Arts, Box 1020, Stn. 28, 107 Tunnel Mountain Drive, Banff, Alberta, Canada, T0L 0C0.

Just Intonation Calculator, by Robert Rich and Carter Scholtz. A composer's tool for just intonation. Internal sound for tuning reference; microtonal ear training; shows modulations; reduces fractions; converts between ratios, cents and Yamaha tuning units; MIDI tuning dumps for many brands of synths, and supports MIDI tuning dump standard; includes dozens of tunings. Requires Macintosh and Hypercard. Only \$10.00. Soundscape Productions, Box 8891, Stanford, CA 94309.

**MICROTONE GUIDE**. 34 page booklet of microtunings for synthesizers or new instruments. Ethnic, historic, just, and equal tunings. Good source-book for beginning microtonalists. \$7.50 to C. Fortuna, 1305 Hartwick, Royal Oak, MI. 48067

The former vice president, finding himself unexpectedly out of work, was fortunate in having family connections in the newspaper business that allowed him to land a job as movie reviewer at a large midwestern daily. In his first review he wrote, "Malcolm X seemed like an interesting movie; however, I found the story line difficult to follow. Perhaps it would have made more sense to me if I had seen the others in the series, 'Malcolm I' through 'Malcolm IX'."

**IBM CLONE FREWARE** for JUST INTONATION. Freestanding program calculates just modulations/demodulations/intertones/complements, as well as string positions and ratio to cents. Menu driven, includes source code. Send formatted disk 5 1/4 or 3.5 inch, one dollar return postage (suggested) or trade material. NOVOSONICS, RFD 1 Box 312, Conitocook, NH 03329.

**QUARTZ CRYSTAL "SINGING" BOWLS**, frosted and clear in 12 sizes, in all musical notes available - magical - powerful healing tools for meditation and stress elimination, balancing energies, etc. Also available: hand-held square drums, hoop and dance drums as well as water and ceramic kettle drums, various types of RAINSTICKS, melodious chimes, bells, cymbals. Largest distributor, lowest prices. The CRYSTAL STORE 1-800-833-2328.

**A REMINDER** - Unclassified ads here in EMI's notices column are free to subscribers for up to 40 words; 40¢ per word thereafter. For others they are 40¢ per word, 15 word minimum, with a 20% discount on orders of four or more insertions of the same ad.

**MICROTUNAL MIDI TERMINAL** (vers. 1.2) by Denny Genovese lets you play nearly any MIDI synthesizer in Just Intonation! A veritable "tuning processor" as well, it has many features for constructing, editing, transposing, analyzing and printing Just Scales. Tuning data is shown in Ratios, Cents, Frequencies and Yamaha TU's. Those without a MIDI instrument can hear the Just scales on the computer's built in speaker. Holds 16 scales in memory, which are selected by single keystrokes. Tunings may be transposed into any key with another quick stroke. Requires IBM XT/AT or compatible and, for performance, an MPU-401 or compatible MIDI interface. \$60 from DENNY'S SOUND & LIGHT, PO Box 15464, Gainesville, FL 32604.

**SUBSCRIPTIONS TO EMI**: \$24/yr for U.S.; \$27/yr for Canada & Mexico; \$34/yr overseas. California residents add 7.25% sales tax for a total of \$25.74. Order from EMI, Box 784, Nicasio, CA 94946, USA.

**EMI BACK ISSUES**: Bound volume sets Vol I through Vol V: \$17 per volume. Single issues Vol VI #1 through Vol VII #6: still \$3.50 per issue. Single issues Vol VII #1 and later: \$6.00 per issue. These prices include postage for U.S., Canada & Mexico air, and overseas surface rate. In California add 7.25% sales tax. For overseas air add 20%. Order from EMI, PO Box 784, Nicasio, CA 94946, or write for complete listing of back issues and their contents. Corresponding cassette tapes also available for most volumes; see information below.

**CASSETTE TAPES FROM EMI**: \$8 per cassette for subscribers; \$10.50 for non-subscribers. Prices include postage for U.S., Canada, Mexico air, and overseas surface rate. In California add 7.25% sales tax. For overseas air add 20%. Each tape contains music of instruments that appeared in the newsletter during the corresponding volume year, comprising a full measure of odd, provocative, funny and beautiful music. Volumes II, III, VI and VII remain available; volumes I, IV and V are now sold out. Order from EMI, Box 784, Nicasio, CA 94946.

**FoMRHI Quarterly #71**, April 1993 (J. Montagu, c/o Faculty of Music, St. Aldate's, Oxford OX1 1DB, U.K.) contains the usual generous serving of highly specialized information on historical instruments and their construction.

**CAS Journal Vol. 2 #3** (Series II), May 1993 (112 Essex Ave., Montclair, NJ 07042) contains articles on rib bending, resonance frequencies in violin top plates, acoustic effects of violin tail-pieces, effects of f-holes and bass bar, and more. Also included is Norman C. Pickering's "Problems in String Making," which is of more potential interest to lay people, as it is less technical and still highly informative.

**The Galpin Society Journal XLVI** March 1993 (38 Eastfield Road, Western Park, Leicester LE3 6FE, England) breaks from the Galpin Society's traditional emphasis on historical European instruments by including quite a few articles on instruments from other parts of the world. Among them:

- A report on fragments from a lyre of over 2000 years old;
- A survey of instruments of the San Pedro culture (west coast of South America, A.D. 300 - 900);
- A report on the *Nolkín*, a Chilean trumpet played by sucking rather than blowing;
- A history of the Chinese *erhu*;
- A bit more information on the flat trumpet, a 16th century European slide trumpet that was discussed in a previous issue of the journal.

**Xenharmonikon 14**, Spring 1993 (from Frog Peak Music, Box A36, Hanover NH 03755) contains a series of articles by Brian McLaren on the lesser-known equal temperaments. There are also microtonal scores by Ivor Darreg, Carter Scholz, Larry Polansky and Douglas Walker, and a computer program for just intonation calculations by Matthew Walker. Also, Ivor Darreg's journal of observations on the world of microtonal music, **Xenharmonic Bulletin #12**, is bound in its entirety into this issue of **Xenharmonikon**.

The premier issue of **The Woodwind Quarterly**, May 1993 (Northstar Publishing, 1513 Old CC Rd., Colville, WA 99114), contains a generous helping of articles on woodwind topics:

- "The Goosman Headjoint" by Jack Goosman describes an alteration in flute lip plate shape designed to improve volume. The following article, "Headjoint Acoustics - a Comparison" by John W. Colman, uses spectrum analysis and loudness comparisons to assess the sounding properties of the Goosman headjoint as compared to a more conventional headjoint.
- "Shakuhachi Making in America", by Monty Levenson, discusses shakuhachi making (accompanied by excellent photographs) and provides background in cultural context, small-scale technology, and Levenson's approach to instrument making as a small business.

"Three Baroque Soprano Recorders by Richard Haka", by Jan Bouterse, provides excellent practical notes on making copies of early woodwinds.

"Haynes, Haynes and Haynes," by Susan Behrdahl, is a history, replete with early factory-floor photographs, of the flute company founded in the 1880s.

This issue also contains interviews with baroque oboe maker Marsha Taylor, Stan Garber of Selmer, U.S.A., and William Deveau of the Haynes company. There are reports on moisture meters for controlled wood seasoning, and a special wood boring tool. There are book reviews, and several more odds and ends.

*The following is a listing of selected articles relating to musical instruments which have appeared recently in other publications.*

"The Walters Art Gallery 1764 Jade *Qing* Lithophone and Related Pieces" by Terese Tse Bartholomew and Mitchell Clark, in *Journal of the Walters Art Gallery* 49/50, 1991/92 (600 North Charles St., Baltimore, MD 21201).

A report on surviving ancient Chinese stone chimes.

"Good Vibrations by Matthew Nicholl, in *Invention & Technology*, Spring 1993.

An article on early electronic instruments, emphasizing theremin and telharmonium.

"Professional Musical Saws — Part 3" by Luther Harris, in *Musical Saw News* #18 (PO Box 84935, San Diego CA 92138-4935).

Third in a series of very brief pieces on made-for-music saws, this one focussing on the Stradivarius model made by Sandviken Tool Company in Sweden.

"The Jew's Harp: A Buyer's Guide by Gordon Frazier, in *Pluck*, Winter 1993 (PO Box 14466, Seattle, WA 98114).

A rundown of several available makes of jawharp with comments on their strengths and weaknesses.

"The Reeded Mouth Bow" by Wayland Harman, also in *Pluck*, Winter 1993 (address above).

Notes on the author's experiments in making a mouth-resonated chordophone, with an eye to producing better volume from this normally very quiet instrument.

"Features of Tunable MIDI Synthesizers" by Robert Rich, in *I/I* Vol. 8 #1, March 1993 (535 Stevenson St., San Francisco, CA 94103).

A listing of tunable, MIDI-compatible synthesizers with information on what functions each of them supports.

"The Music Man" by Karen Hutchinson, in *The Peninsula Times Tribune* January 11 1993 (Palo Alto, CA).

An article on scrap materials instrument maker Herb Moore.

"The Stan Kenton Mellophoniums" by Scooter Pirtle, in *The Middle Horn Leader* Volume II #3 (PO Box 8402, Paducah, KY 42002).

The story of the introduction of an unfamiliar instrument into an established musical format — how Stan Kenton brought the Conn Company's recently-introduced mid-range conical brass instrument, the Mellophonium, into his orchestra in the early 60s.

"John Rose The Violate Tradition", interview by John Corbett in *Coda Magazine* May/June 1993 (Box 87, Station J, Toronto, Ontario, M4J 4X8, Canada).

An interview with John Rose, whose life revolves around violins unmade, remade and dismaded in every possible configuration, both conceptually and physically.

"Technical Dulcimer" by Sam Rizzetta, in *Dulcimer Player News* April-June 1993 (PO Box 2164, Winchester, VA 22604).

This month in his regular column on dulcimer construction, Sam Rizzetta discusses the qualities of different woods for dulcimer making.

"Sculptor un Tambour (Ouganda)" (no author credited), in *Percussions* #28, March/April 1993 (18, rue Théodore-Rousseau, F-77930, Chailly-en-Bierre, France).

Information on the fabrication of a Ugandan drum. In French.

"Mridangam et Tabla: Un Contraste" by David R. Courtney, also in *Percussions* #28, March/April 1993 (address above).

Notes on the history, construction, timbre and technique of the two Indian drum types. In French.

"The Niche Hypothesis" by Bernard L. Krause, Ph.D., in *The Soundscape Newsletter* #6, June 1993 (World Soundscape Project, Dept. of Communication, Simon Fraser University, Burnaby, B.C., Canada V5A 1S6).

An exploration of the idea that animal sounds have developed in ways that allow them to fit their surrounding sound environments in specific ways, and that human alteration of the environment impacts the sonic world in which animals live in ways rarely taken into account.

"King at 100 (no author credited), in *The Music Trades* June 1993 (80 West St., PO Box 432, Englewood, NJ 07631).

A history of King, the band instruments manufacturing company, with both contemporary and historical photographs of production techniques.

"Harp Woods by Dave Thormahlen, in *Folk Harp Journal* #80 (4718 Maychelle Dr., Anaheim, CA 92807-3040).

A report on woods and wood milling for harp making.

"World's Largest Musical Instrument Auction" by David M. Laws, in *TechniCom* Volume 17 #2 (Box 51, Normal, IL 61761).

A report on the huge annual musical instruments auction held at the Northwest Folklife Festival in Seattle, May and June of each year. As always, this issue of *TechniCom* also has lots of shop tips for band instrument repair people.

"Rohe Unmittelbarkeit: Musica Automata — der Klang des 19. Jahrhunderts" by Caroline Wilkins, in *Musiktexte* 48, February 1993 (D-5000, Postfach 10 13 48, Köln 1, Germany).

19th century mechanical instruments put to contemporary use. In German.

"That Gut Feeling: The World of Early Strings" by Paul Laird, in *Continuo*, June 1993 (PO Box 327, Hammondsport, NY 14840).

In the 2nd half of this regular column, the author tells how Yo-Yo Ma has recently been concertizing and recording with the alto violin developed in recent years by Carleen Hutchins and others associated with the Catgut Acoustical Society.

*Continuo* April 1993 (address above) contains articles on hurdy-gurdy and early piano.

*Musicworks* 55 (1087 Queen St. West, Toronto, Ontario, Canada M6J 1H3) is a special focus issue on the subject of sound ecology. The articles include:

"Sonic Weaponry" by Mike Zagorski, on recent developments in understanding of the impact of man-made environmental noise;

"A Report on the 7<sup>e</sup> Printemps électroacoustique" by Claude Schryer, describing the 1992 festival (which featured lots of interesting sound instruments and installations);

An article (in French) on Jacques Duden's photoelectric synthesizer;

"Jolted Awake" by Susan Rawcliffe, a discussion of her work with unusual and imaginative flute forms derived from pre-Columbian instruments. In this article Rawcliffe talks about her own creative work, in contrast to her recent article in *EMI* which was primarily devoted to describing the early American types.